FLIGHT MAGAZINE

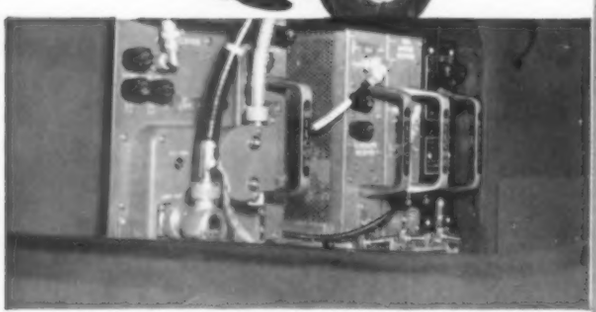
MAY 1959
50 cents

MAY 25 1959
Cent. Copy

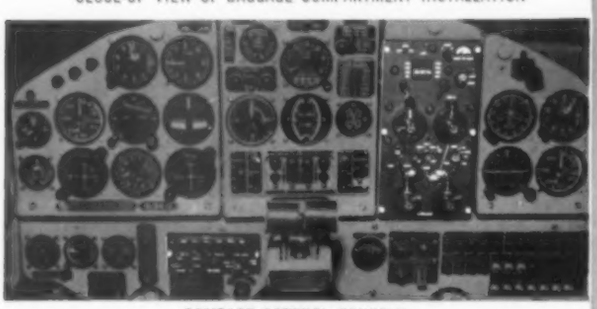
TRECKER-PIAGGIO P-166 BUSINESS TWIN

(See page 28)

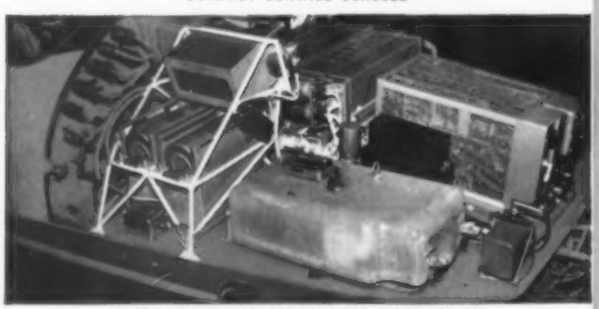
Accurate Navigation and Reliable Communications . . . *at more than 6 miles per minute!*



CLOSE-UP VIEW OF BAGGAGE COMPARTMENT INSTALLATION



COMPACT CONTROL CONSOLE



CLOSE-UP VIEW OF CANARI NOSE INSTALLATION

America's First Executive Jet Flies With Compact, Lightweight, Dependable ***wilcox*** CANARI Equipment

With the introduction of the Beech MS 760 Jet, a new era of executive air travel is beginning.

Also beginning is a new era in communications. Flying at higher altitudes and at much greater speed increases the burden on radio communications and navigation equipment. Accuracy and reliability of "nav-com" equipment is crucial!

The Wilcox CANARI System meets the challenge of the jet age with airline category equipment that is unparalleled in performance and dependability . . . permits the sleek business jet to enjoy the advantages of a full complement of CAA approved, airline standard equipment without the disadvantages of large size and weight previously associated with such complete systems.

When choosing "nav-com" equipment for your aircraft, whether it is a jet or piston type, you can choose the Wilcox CANARI System with confidence because Wilcox has pioneered in the design and development of this type of equipment. For complete details and technical data on Wilcox CANARI equipment for your airplane, we invite you to visit your authorized Wilcox dealer, or write, wire or phone us, as you prefer.

Customized installations of *wilcox* CANARI equipment are available for most popular types of business aircraft.

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DART PROP-JETS

power

THE VICKERS VISCOUNT,
THE FAIRCHILD F-27,
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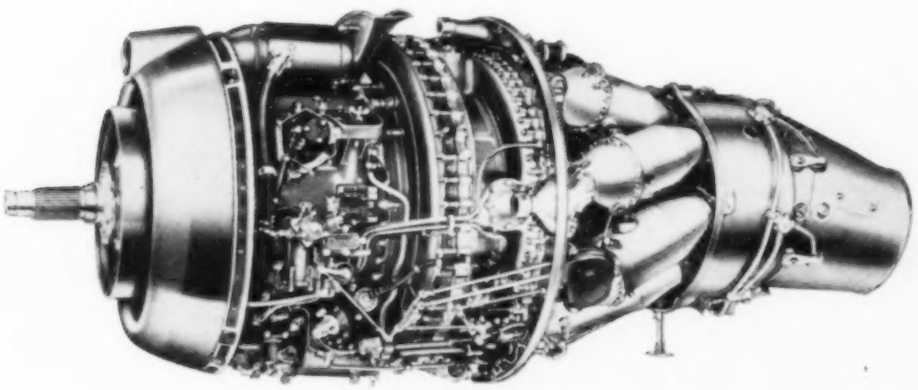
THE GRUMMAN GULFSTREAM,
THE ARMSTRONG WHITWORTH ARGOSY
and have been chosen for
THE AVRO 748



For airline, local service carrier and executive operation, the Rolls-Royce Dart is the most proven prop-jet in the world. It has flown over 7,000,000 hours in scheduled airline service and has an overhaul life of up to 2,300 hours.

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For a 14" x 10" lithographic print, suitable for framing, write Aviation Division . . . Request Historical Series #2.

The beginning of psychological warfare . . . Max Immelmann in a Rumpler Taube drops a surrender note on Paris.

Early War Birds—THE RUMPLER TAUBE

When World War I began, Germany had about 100 first-line observation planes of the "bird" or Taube type—so called because the shape of their wings and elevators gave them a bird-like appearance in flight. Of the various Taube designs of the period, the Rumpler two-seater was one of the most successful. Equipped with a 100 h.p. Daimler engine, it boasted a top speed of 75 m.p.h. and was especially noted for its high-flying qualities, holding a world's altitude record of close to 20,000 feet. The French had dubbed the Rumpler Taube, "the invisible plane", because the clear doped wings of some models made them almost impossible to spot at higher altitudes.

When the German Army stood at the outskirts of Paris in the early weeks of the War, a Rumpler Taube, piloted by Lieutenant Max Immelmann, flew lazily over the city. Although nothing more lethal was dropped than a note exhorting them to surrender, the Parisians were awakened to danger of air attacks. Immelmann and his Rumpler Taube foreshadowed new offensive uses for airplanes.

Immelmann, a brave and skillful flyer, went on to become an outstanding fighter pilot and, at the time of his death in June, 1916, was Germany's leading "Knight of the air." He is best known for the maneuver he devised—"The Immelmann", a half loop with a roll-out on top.

Phillips 66

● A pioneer in the development of aviation fuels, Phillips Petroleum Company is today a leading supplier of high octane gasoline for commercial, private, and military aircraft . . . and of *super-performance* jet fuels for turbo-props and jets. And Phillips research continues to lead the way, developing new fuels for the aircraft of tomorrow.

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AIR Report
Significant Trends and News

BUSINESS AIRCRAFT SALES are running far ahead of last year, with nine aircraft manufacturers delivering 1,952 new airplanes at $32,064,000 in billings during the first quarter of 1959 as compared to 1,659 planes and $27,425,000 in billings for the first quarter of 1958. As listed by the Utility Airplane Council of the Aircraft Industries Association, the 1959 deliveries and billings for the January-March quarter are as follows: Aero Design, 32 planes and $2,254,000; Beech, 192 planes and $7,310,000; Call Air, 13 planes and $105,000; Cessna, 958 planes and $12,678,000; Champion, 69 planes and $357,000; Colonial, 5 planes and $101,000; Helio, 9 planes and $277,000; Mooney, 58 planes and $664,000; and Piper, 626 planes and $8,318,000.

AIRSPACE ALLOCATIONS formerly authorized by the Air Coordinating Committee are now handled solely by the Federal Aviation Agency, which has established new and simplified procedures with provisions for public and private agencies and interested parties to have equal opportunity in presenting their views and opinions before the designation of restricted areas. FAA Administrator E. R. Quesada said FAA personnel at Washington and regional levels are available to assist, on an informal basis, any agency, group or person with their airspace problems or with preparation of their requests for airspace assignments. In addition, FAA has organized a special staff to deal with airspace matters and to develop airspace policies. . . . **THREE ADIZ ZONES WERE DISCONTINUED** on April 1 — the Western, Eastern and Presque Isle zones — and flight requirements within remaining zones were relaxed.

ITS STOCK CURRENTLY ENJOYING RECORD HIGH QUOTATIONS, Cessna Aircraft Company last month boosted its quarterly cash dividend rate from 40 cents to 50 cents per share. Dwane Wallace, president, said sales for the first half of the firm's 1959 fiscal year were $47.3 million, up $3 million from the same 1958 period and including $2.5 million for Aircraft Radio Corp., which became a subsidiary on Feb. 1.

WORLD SPEED RECORD for the Aero Commander 680E was established on April 13 by Miss Jerrie Cobb, factory pilot, by averaging 226.148 mph. over a 1,242.7-mile course timed in 5 hrs. 29 mins. 33.9 secs. This is for aircraft in the Aero Commander's weight category, for which the old record was 223.713 mph. and held by a Russian Yak II.

NO LONG AIRPORT TERMINAL "FINGERS" for passengers will be used at Washington's new jet airport at Chantilly, Virginia — FAA has specified the use of "mobile lounges" carrying up to 80 passengers per load between parked planes and individual airline terminal gates. This system is used in Europe, with bus-like trailers pulled by tractors. Long walks through "fingers" are thus eliminated.

OVER 52 PRIVATE PLANES HAVE BEEN ENTERED in the Flying Physicians Association's Alaska Air Cruise, which will start from Edmonton, Canada, on June 17, preceded by a June 14 rendezvous at Great Falls, Montana. Entries include 18 Beech Bonanzas, 9 Pipers, and 21 Cessnas.

LOCKHEED AIRCRAFT CORPORATION has recently moved into numerous new fields of activity including atomic shipbuilding, monorail design and construction, heavy construction, nuclear products, light airplanes and electronics.

FIRST PROPJET CANADAIR-CONVAIR 540 in airline operations will be flown by Allegheny Airlines beginning July 1. Allegheny leased the 48-58-passenger conversion, powered by two 3,500-hp. Napier Eland engines, and will operate it on daily nonstop commuter schedules between Pittsburgh and Atlantic City. After a 3-month operation, the local carrier will evaluate the 340-mph. Canadair's operations to determine the size and timing of any order which it might place for a jet-prop fleet.

TWO MAJOR EQUIPMENT CHANGES feature a new T-37B

(Continued on page 56)

FLIGHT MAGAZINE

MAY, 1959 VOL. 48, No. 5

THIS MONTH'S COVER shows America's newest light twin for business flying, the big-cabin Trecker-Piaggio P-166, as photographed by FLIGHT MAGAZINE in Italy, where it was developed from the Piaggio Royal Gull amphibian. The 6-8-place P-166, powered by two supercharged 340-hp. Lycomings, is marketed in America by Trecker Aircraft Corp., Milwaukee. For details, see pages 28-32.

Air Report—SIGNIFICANT TRENDS AND NEWS 5

Just Among Ourselves—EDITORIAL COMMENT: SUCCESSFUL WORLD CONGRESS OF FLIGHT; NATA'S CHARLES PARKER; KEY TO SURVIVAL 17

Light Twin With Biggest Cabin—BY TOM ASHLEY — WE WENT TO ITALY FOR DETAILS OF AMERICA'S NEWEST BUSINESS TWIN . 28

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Gulfstar for Corporate Fleet Needs—INTERESTING MODIFICATIONS AND EQUIPMENT PACKAGE SELECTED FOR GULF OIL'S AIR FLEET 34

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Altitude and Course Couplers for Low-Cost Automatic Flying—TWO INTERESTING ACCESSORIES FOR MITCHELL AUTOPILOTS . 41

Jet for Beginners—BY GEORGE E. HADDAWAY—FLIGHT IMPRESSIONS OF TEMCO "PINTO" FOR NAVY STUDENTS 42

Our Disappearing Airspace As Seen By Military, Airlines and General Aviation—VIEWS FROM WORLD CONGRESS OF FLIGHT SYMPOSIUM 46

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New Business in the Hangar—NATIONWIDE ROUNDUP OF INTERESTING DEVELOPMENTS IN BUSINESS FLYING 60

GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; LOUISE ROBERTSON, Circulation; E. H. PICKERING, Consultant; P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas — Telephone TAylor 3-6191.

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Why Lockheed built the JetStar—
World's fastest corporate plane

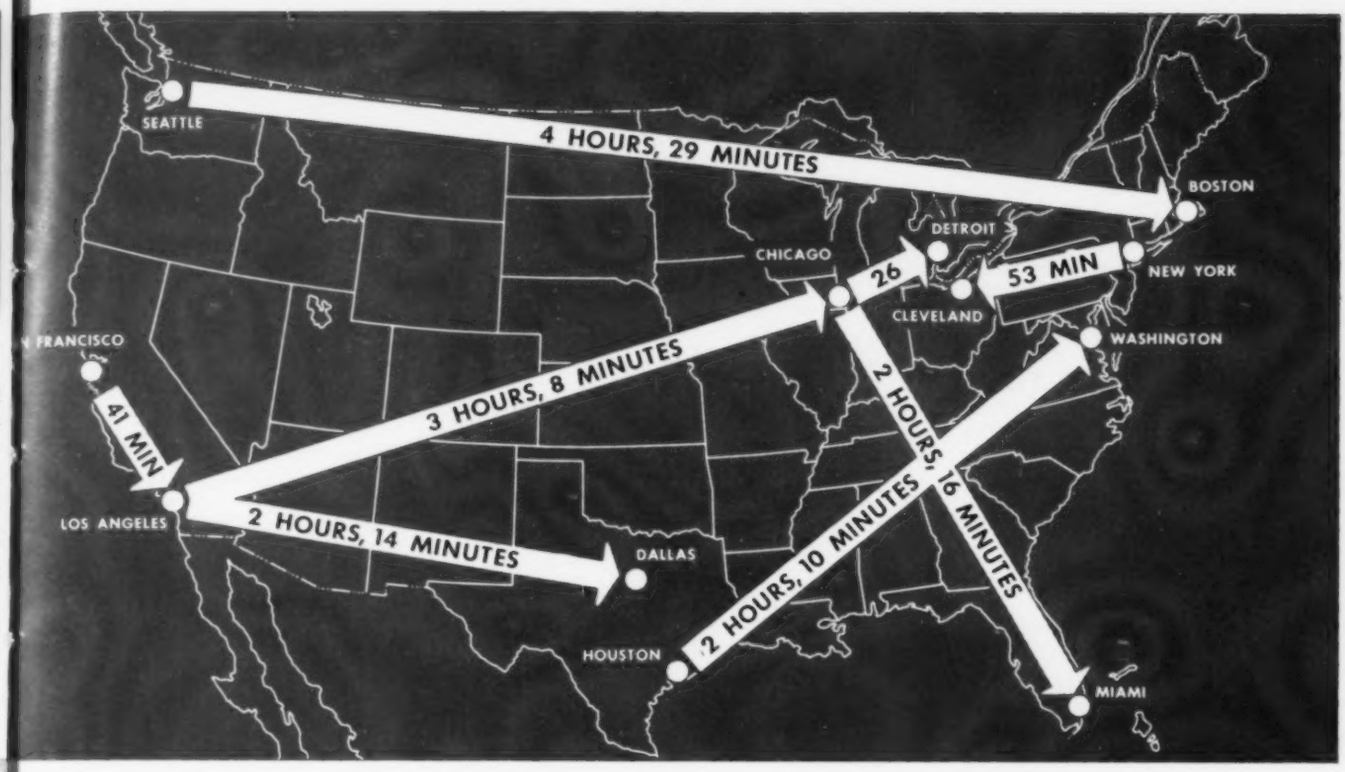
Faster by 200 miles-per-hour than piston-engine and turboprop planes, the new Lockheed JetStar obsoletes all other corporate aircraft.

In addition to matching the trans-continental non-stop speed of the big jet airliners, the JetStar also has good short-field capabilities equaling those of many other business aircraft. A 200-mile trip is only a 23-minute flight in a JetStar. And you leave at *your* convenience.

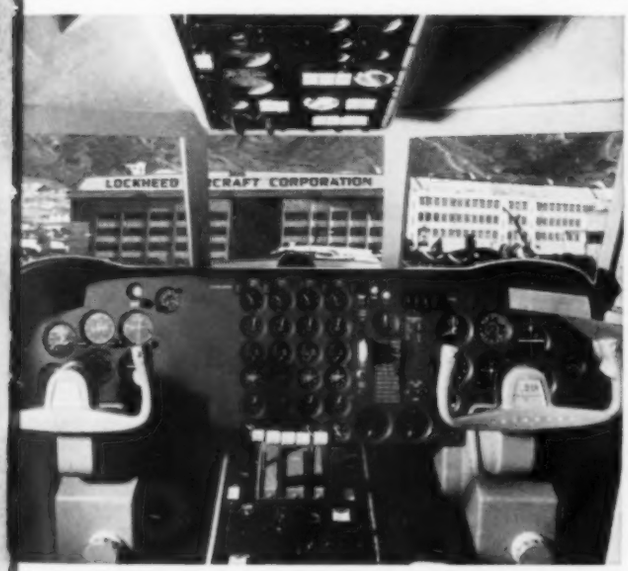
The JetStar's four-engine reliability and over-the-weather altitude performance (up to 45,000 feet) enables it to speed executives and technical personnel to their destinations, safely and comfortably—when other corporate planes are grounded.

Backed by Lockheed's quarter-century of experience in building history-making transports, the JetStar was designed to provide Jet Age decision-makers with the swift mobility demanded by today's fast-paced events.

Now in production at Lockheed's Georgia Division, the JetStar is the world's fastest transportation for the world's busiest men.



One-day round trips that take two or more days in present corporate aircraft are easy in a JetStar. Map shows typical flights.



Roomy and efficient JetStar cockpit has adjustable seats, dual flight controls and instrument groupings, weather radar, and broad, high-visibility windshield.

Fully pressurized and air-conditioned, the JetStar's cabin is quiet and vibration-free in flight. Wide choice of customized interiors, each with galley and lavatory.

For complete information about the JetStar, write: JetStar Commercial Sales, Lockheed Georgia Division, Marietta, Georgia

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LIGHTWEIGHT LOW COST AUTOPILOT PERFORMING
ALL THESE FUNCTIONS FOR ALL PLANES—T-CRAFTS TO TRANSPORTS

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- ✓ Precise, long-term heading hold, by displacement (Directional) Gyro
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- ✓ Instantaneous servo response
- ✓ Proportional servo response
- ✓ Follow-ups—prevent overshoot, permit use of high-power servos
- ✓ Automatic pitch trim
- ✓ All-electric controls—no mechanical engage-disengage, no delicate valves
- ✓ Automatic altitude control available
- ✓ Automatic ILS approach coupler available
- ✓ Thoroughly proved—2000 in use during eight-year period
- ✓ CAA-Certificated for all leading airplanes, S.E. & Twin (19 models)
- ✓ Yaw damping
- ✓ Visual directional & attitude Gyro reference

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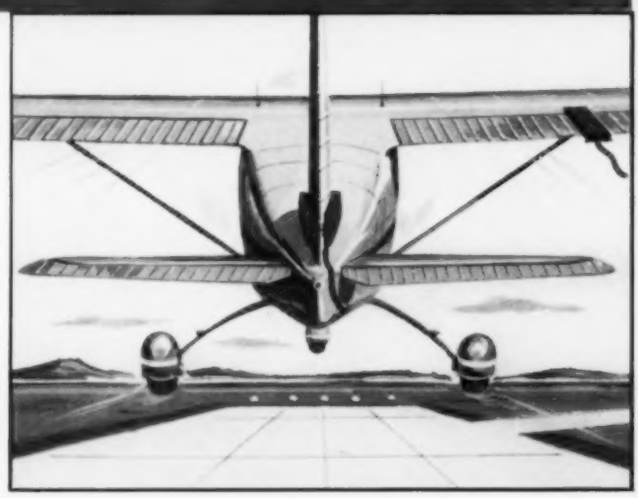
LC-40

WING TIPS

COMPASS CAPERS. Metal objects such as pliers, earphones (particularly when on the head), cameras, etc., when positioned near your compass, can cause a deviation of many degrees. Also, prop de-icers, when turned on, can make it read up to 12° off.



POINT OF NO RETURN. Even experienced pilots have sometimes taken off with gust locks still firmly attached to ailerons, elevators and rudder. Avoid foolish mistakes like this. Always check your controls for full freedom of movement before taking off.

BLIND TAKE-OFF. Be careful of puddles on the runway. Water splashing onto the windshield can obscure vision completely. And in freezing weather the resulting ice may be difficult to remove.

REMEMBER! For "Happy Flying"... look for the famous ESSO Sign for the most dependable aviation products.

FLYING CHARGE ACCOUNT. Here's real convenience – get an Esso Aviation Credit Card from your Esso Aviation Dealer. When you land, your plane can be completely serviced without making any cash payment. With an Esso Credit Card, you can charge gasoline, oil, and lubricants *plus* tire and battery service, landing fees, overnight in-transit storage and minor repairs.

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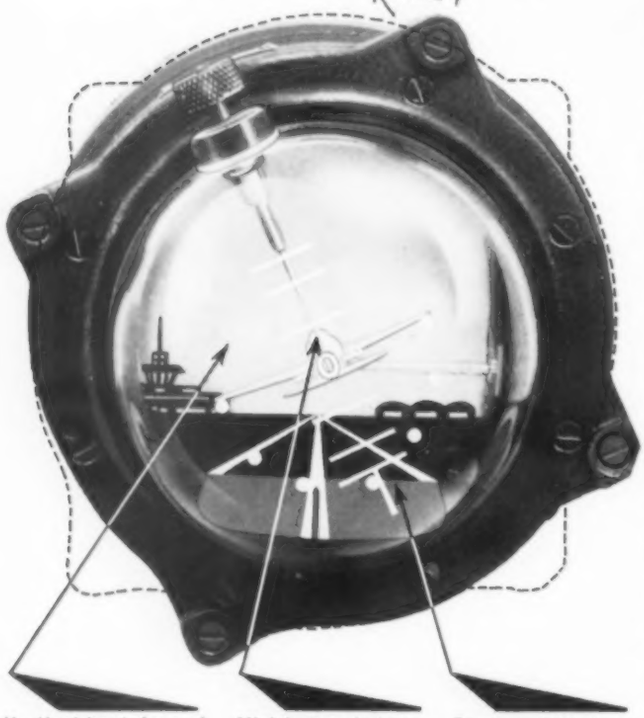
Highways or Skyways..."ESSO RESEARCH works wonders with oil"

The Artificial Horizon isn't "Artificial" Anymore!

Now you can see yourself fly...with the

COFFING 3-D HORIZON

- **Offers the best possible help for pilot's loss of his most critical aid—visual contact with the ground.**
- **Inhibits tendency of all pilots toward dangerous vertigo—even under extreme stress conditions.**
- **Gives instantaneous, precise 3-dimensional attitude readings, making it easier and more relaxing to fly, even in rough air.**
- **Eliminates "gauge chasing" when immediate reading of the plane's attitude is essential.**



Vertical back face of the instrument gives full panoramic skyline.

Miniature airplane, connected by linkage to gyro axis, gives direct and instant pitch and roll readings.

Representative terrain platform remains parallel to ground at all times.

This epoch-making instrument must be FLOWN under IFR conditions to be fully appreciated. A demonstration will convince you the Coffing 3-D Horizon is a safety necessity for all aircraft.

Yes, now—the artificial horizon is no longer artificial. By a simple, yet unique improvement upon the basic features of the latest attitude indicators, Coffing gives you the ultimate in a functional flight instrument. The 3-D is designed for installation in all aircraft in 30 minutes or less.

One glance at the miniature aircraft within the plastic dome of the 3-D Horizon gives the pilot a perfect, instantaneous and sensitive portrayal of the attitude of his aircraft. He can see himself fly! To maneuver any airplane safely—a pilot merely flies the little aircraft in his 3-D.

The 3-D Horizon allows the pilot to make *180 degree and all other turns* with confidence and ease . . . helps cut instrument training time considerably—because it helps to remove the feeling of disorientation and the accompanying fear. *It instills confidence.*

Priced at only $375.00 the Coffing 3-D is guaranteed against defective parts and workmanship for six months. Regardless of the time on the instrument.

Organized only last year, the Aircraft Instruments and Systems Division of Coffing Industries, Inc., has already perfected a variety of functional supplements to safer more efficient, easier flight. MORE and GREATER things are to come from this growing research organization.

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NOW! TWO CONVENIENT SIZES . . .

Large Economy Model at $635,000 • Handy Personal Model at 98¢

For the first time, you can now get the Fairchild F-27 – first American turbine-powered transport in service with airlines and corporations – in two (2) sizes. The Large Economy Model, priced to sell at only $635,000, gives you everything you've ever wanted in an airline or executive transport:

300 m.p.h. speed . . . luxurious, roomy, stand-up cabin (40 seats for airlines, custom-designed flying office or cargo carrier for business) . . . air conditioning . . . pressurization . . . rapid simultaneous loading of passengers, cargo . . . sleek, modern design . . . unsurpassed short-field capability . . . operating economy . . . easy maintenance . . . propjet power.

The Handy Personal Model F-27, superbly styled by master model-maker Revell from authentic Fairchild blueprints, is yours at a rock bottom 98 cents at your local model dealer. The Fairchild insigne or decals of a number of the 13 airlines that have purchased the F-27 are available. Or you may prefer to decorate with insignia of 20 large corporations that have ordered the F-27.

Whether you choose the Handy Personal Model at 98 cents, the Large Economy Model for only $634,999.02 more, or both for $635,000.98, you've got the best buy in aircraft today.

Penny for penny, dollar for dollar, the F-27 is your best investment as a profit making airliner, as an efficient, fast, far-ranging corporation transport.

FAIRCHILD F-27

FAIRCHILD ENGINE AND AIRPLANE CORPORATION • HAGERSTOWN, MARYLAND

WHETHER OR NOT YOU ARE CONSIDERING AN AUTOMATIC PILOT FOR YOUR AIRPLANE

YOU SHOULD READ THIS

Time was when an automatic pilot was considered an extra frill that really was nothing but a luxury in a private airplane. Time was, too, when you never dreamed of having more than one radio in your airplane and a single crystal or two were all you needed for communications.

Today adequate radio has become a must for any efficient business airplane, and an automatic flight system has come to be accepted as an equally important piece of equipment. For instrument flying, especially single-handed, an autopilot is a must. With an automatic flight system, much of the sweat of instrument work disappears. You're free to copy clearances, figure estimates without having to keep the airplane under control, without having to get it back on course. Makes all the difference in the world!

If You Don't Fly Instruments?

But what if you're one of the thousands of businessmen pilots who use your aircraft only VFR for business travel? If you fly over 150 hours a year you, too, will find an automatic flight system the most wonderful, useful addition you can make to your airplane.

We all know how simple it is today flying modern business airplanes. They're safe, stable and navigation is no problem. With an Omni and/or your ADF you just tick off the check points. But until you fly with an automatic pilot, especially one with a Course Selector and Heading Lock such as on the Tactair T-3, you aren't aware of the constant fatiguing attention you're paying to holding a course, making small corrections to keep the Omni or ADF needle where it belongs. If you take time out to read the map, re-tune your radio or fiddle with the mixture, you're off course 20 or 30 degrees.

Now, with an autopilot, you're completely relieved of control-handling responsibilities. You can direct your attention to communications or navigation and know the airplane will stay on course. What this really means will show up at the end of a trip. You're so much more rested and relaxed, far less fatigued. The reaction from the average pilot who has installed his Tactair is, "How long has this been going on?"

Far from a luxury, an automatic flight system pays off in straighter cross-country flights, increased personal efficiency at the end of the trip, and *much safer* operation.

What if You're Just a Beginner With Your First Airplane?

Some form of automatic flight assist is as useful to the brand new private pilot with his brand new business airplane as it is to the veteran IFR or VFR pilot. Let's face it, when you start flying cross-country you have your hands full. Radio work, navigation, looking out for traffic *plus* keeping the airplane on course keeps you busy all the time. With an automatic flight system you're suddenly relieved of the "chores" involved with flying. Suddenly you have plenty of time to handle the overall direction of your flight; you're free to work radio, take Omni bearings, look for other traffic, *unhurried and unharried*. You'll simply get a lot more usefulness out of your airplane.

Makes Little Difference

In short, it makes little difference whether you're an IFR pilot, experienced VFR pilot or just starting to learn how wonderful an airplane can be in speeding your business and pleasure travels. You will find an automatic flight system just as useful and essential as proper radio equipment in your airplane—well worth every cent you invest. You'll never regret adding this equipment.

Why Has Tactair Become the Leading Autopilot Manufacturer?

That's easy. The Tactair system is the best one yet conceived. The T-3 three-directional, fully automatic pilot is by far the widest selling autopilot in use today. Its smooth pneumatic operation has an almost "human" touch. It has an exclusive Course Selector which allows you to set the course you want on an upper compass card of the Directional Gyro. With the Heading Lock the airplane automatically turns to the course you want and will hold that course to the exact degree. With the Pitch Control you can set the airplane for precise level flight or any angle of climb or descent.

The T-3 is approved on the Beech Bonanza, Travel Air; Cessna 175, 180, 182, Skylane; and Piper Apache.

Levelair by TACTAIR

Recognizing the importance of an automatic flight system in aircraft used by business pilots, Cessna Aircraft turned to Tactair to develop a simple, low-cost automatic flight system for its Mighty Middle Line. The result—the Levelair by Tactair is exclusively available as factory or field-installed equipment on most Cessna models. The T-1 Levelair provides sensational autostability, keeps the wings level, holds the airplane straight. The T-2 incorporates the famed Tactair Course Selector and Heading Lock. Both the T-1 and the T-2 can be converted to a full T-3, building-block fashion. If you're buying a Cessna 175, 180, 182 or Skylane be sure to specify the Levelair.

FREE CONTROL HEAD "DUMMY." If you own any of the T-3-approved airplanes listed above, we'll send you a neat Tactair control head dummy with "sticky-back" adhesive for easy panel mounting. You can see for yourself how a Tactair will look in your airplane. Just drop us a line indicating what type plane you own. We'll send you a Tactair brochure, too.

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NAVAL AVIATION MAKES HISTORY
with ALL-JET TRAINING

NAVCAD Earland R. Clark of Stroudsburg, Pa., receiving congratulations from Rear Admiral Joseph M. Carson, Chief of Naval Air Basic Training.

On March 13 at the Naval Air Basic Training Center, Saufley Field, Pensacola, Florida, the first student pilot in Naval Aviation history soloed a primary jet aircraft — without previous propeller-driven aircraft experience. The flight was made in a TT-1 "Pinto" — designed specifically by Temco for all-jet training.

The first primary jet trainer ever purchased by any of the U. S. military services, the Pinto is designed for today's jet age. It is built closely along the lines of high-performance jet fighter aircraft and gives the student pilot the "feel" of jet training from the very beginning.

With its high safety standards, fine handling characteristics, optimum maintenance provisions and overall reliability, the Pinto is an ideal primary jet trainer. From initial cost to operation and maintenance, it is designed to provide better pilots at less cost, in less time. All in all, it gives the Navy a decided edge in the ever-advancing pace of military jet aviation.

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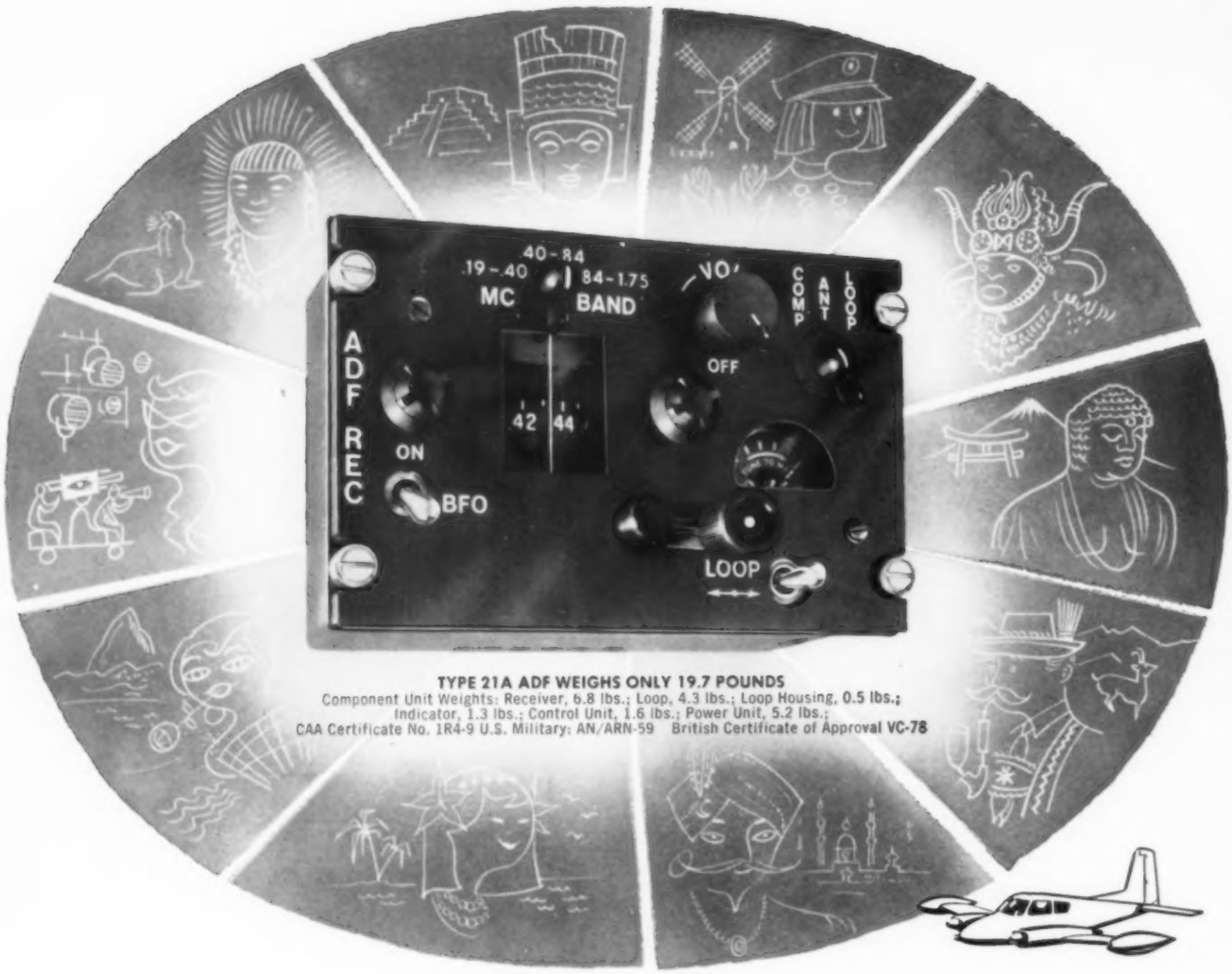
ELECTRONICS • AIRCRAFT • MISSILES

SYSTEMS MANAGEMENT	DEVELOPMENT
DIRECTED RESEARCH	PRODUCTION



TYPE 21A ADF WEIGHS ONLY 19.7 POUNDS
Component Unit Weights: Receiver, 6.8 lbs.; Loop, 4.3 lbs.; Loop Housing, 0.5 lbs.; Indicator, 1.3 lbs.; Control Unit, 1.6 lbs.; Power Unit, 5.2 lbs.;
CAA Certificate No. 1R4-9 U.S. Military: AN/ARN-59 British Certificate of Approval VC-78

World Wide Navigation in Any Language

ARC's TYPE 21-A AUTOMATIC DIRECTION FINDER IS A DEPENDABLE NAVIGATION AID ANYWHERE

Pilots fly confidently over land or sea, in steamy tropics or frozen north, with this reliable basic navigation aid. Throughout the world there are some 60,000 transmitters to which the 21-A can be tuned. The low weight and compactness of this precision instrument make dual installations practicable even in light twins. If you plan to modernize your present radio equipment, or are purchasing a new aircraft, specify ARC's Type 21-A ADF for a long term investment in assurance and safety. Ask your ARC dealer for a quotation on the Type 21-A or any of the other ARC equipment listed below.

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EDITORIALS

Successful World Congress Of Flight

THE first World Congress of Flight, a spectacular project of the Air Force Association staged last month at Las Vegas, was a magnificent accomplishment.

It was the most comprehensive and the only total U. S. aviation show in history and it effectively displayed every facet of American aeronautics from the lowliest putt-putt to the space capsules and rockets of the future.

It was a wide-open show with everybody having an equal opportunity to display their wares. Nearly everybody did so. Never before has there been such overwhelming evidence that U. S. aviation wants, needs and will support a practical, realistic annual display equivalent to or even better than those held each year in England and France.

The World Congress of Flight was many things to many people. Foreign airmen participated in (and incidentally stole) an aerobatic demonstration and fire power show at nearby Indian Springs. NATO airmen and high government officials from abroad gave an international flavor to the affair, climaxed by a banquet seating 6,000 people in their honor. General aviation was much in evidence both in flying and static displays of the latest utility aircraft and equipment. The entire American Jet fleet was assembled for the first time, including the 707, the 880, the DC-8, the Electra, the Fairchild F-27, and turboprop conversions as well as the Comet and the Viscount from Britain.

Symposiums on practically every timely subject in every phase of aviation were held throughout the week. Here again the problems of civil aviation were on an equal footing with the engineering and technical side of military aviation. You paid your money and you took your choice — and there was plenty to choose from no matter where your aviation interests lie. Static displays within and just outside Las Vegas' huge new auditorium plus those on McCarran Municipal Airport contained everything from nuts and bolts to our latest engines and aircraft, civil and military. Important news breaks were a dime a dozen.

Perhaps the greatest pay-off for aviation in the World Congress of Flight was the splendid press coverage. The real clincher came on Sunday, April 19, when General Motors sponsored an hour-long television show on a national hook-up, all of which leads us to believe that it doesn't really matter where our annual showcase of aviation is located so long as it produces the kind of press, radio and TV coverage enjoyed by the Las Vegas show.

Since there is no doubt whatsoever about the success of this initial venture, one would assume that it will become an annual or perhaps a bi-annual affair. Some way must be found to include more participation by the Navy, Army, Marines and other military segments outside the reach of the Air Force Association. But that is a minor problem and one for the industry and government to work out with AFA.

Meanwhile U. S. aviation owes the AFA a debt of gratitude and a rousing vote of thanks for "The Miracle at Las Vegas." They literally hit the jackpot. And it just goes to show you that imagination and bold action are not dead in American aviation!

NATA's Charles A. Parker

THE untimely death of Charles Parker, executive director of the National Aviation Trades Association, deprives general aviation of a zealous and dedicated champion. Parker died of a heart attack in Washington last month at the age of 49.

Few trade association managers can match Charlie's long record of devoted service to the cause of general aviation. While his principal concern was in the field of fixed-base operators, air taxi companies and aerial applicators and all the problems associated therewith, Parker never passed up an opportunity to give a helping hand to other aviation interests when the cards were down in Washington on legislation, regulation or in the field of intra-industry cooperation.

Charlie Parker was a real New England gentleman of the old school. An active pilot throughout his life, he once was a fixed-base operator on Cape Cod and he spoke with authority and the voice of experience when called upon to stand for or against regulatory or legislative policies and programs. He knew economics and strategy but was too outspoken and frank to be classed as a politician. He literally died fighting for the causes he championed in aviation.

Like many dedicated men who burn themselves out championing causes and crusading for principles, Charlie Parker received small reward for his efforts, and only partial support from the branch of the industry he so ably represented. He'll be sorely missed everywhere on the aviation scene but practically irreplaceable in the field of fixed-base operations.

Key To Survival

A COMBINATION of advanced manned aircraft and intercontentinental ballistic missiles is necessary if the U. S. is to maintain a complete deterrence to all-out war by an aggressor.

Push-button intercontinental ballistic missiles can not guarantee complete deterrence simply because it is impossible to locate and destroy all targets with missiles alone. Those targets remaining would provide the aggressor with substantial residual atomic war-making capability. The only way to ferret out the last elements of enemy power is to put manned aircraft in the immediate enemy area.

Nothing less can provide complete deterrence to all-out war. In the process of providing this, the technology necessary to perfect such manned aircraft will also make possible commercial transports capable of revolutionizing air commerce by moving passengers and cargo at three times the speed of sound — more than 2,000 mph. The U. S. can not afford to be second in such a development.

This appraisal has been made to the Congressional House Subcommittee on Armed Services Investigation by J. L. Atwood, president of North American Aviation. The factors he outlined contain logic which can be expected to influence the future of U. S. air defense and air transport progress. They can be summarized as follows:

1. The expressed intent of the potential enemy, coupled with the awesome destructive capability provided by modern technology, forces the free world to try to provide a complete deterrence to all-out war.

2. Maximum deterrence to all-out war requires that we convince the enemy of our determination to make certain retaliation if attacked, backing up this assurance with a visible weapons inventory including capability to destroy every vestige of enemy nuclear war potential.

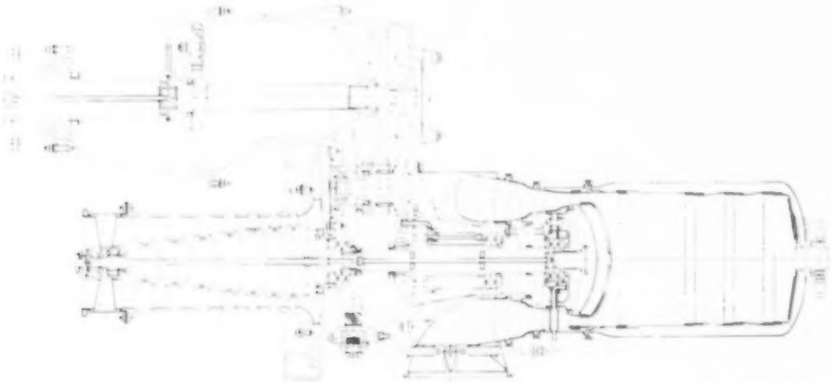
3. Such total retaliation is impossible with missile systems alone. This is so because it is economically infeasible to launch sufficient ICBM missiles at all known targets to insure the probability of absolute military destruction — by the nature of intercontinental ballisic missiles, being purely mechanical and therefore imperfect, some substantial residual atomic war-making capability is a mathematical certainty. Moreover, missile systems are incapable of informing us of missed or new targets where remaining enemy strike capabilities may exist.

4. The only way to recognize missed, new or mobile targets and to ferret out the last elements of enemy power is to put men in the immediate enemy area with the best extension of their faculties that we can technically provide. The judgment of man will always be required in some fashion in the immediate battle area.

5. The sciences involved in extending man's faculties and environment are of a very high degree of advancement. The manned air vehicle's capability of self-defense has been enhanced by technical developments of great importance. The crew will be surveying a battle situation, making decisions and taking action while traveling faster than a shell from a 16-in. gun, and with better information and more time than a motorist has in making many quick decisions on the highway.

6. Manned air vehicles of this advanced system provide a physically-demonstrable presence, assuring the enemy of conclusive action and providing a maximum deterrent to all-out war.

7. These factors call for the indefinite continuation of the mixed-force concept for the U. S. Air Force weapons inventory.

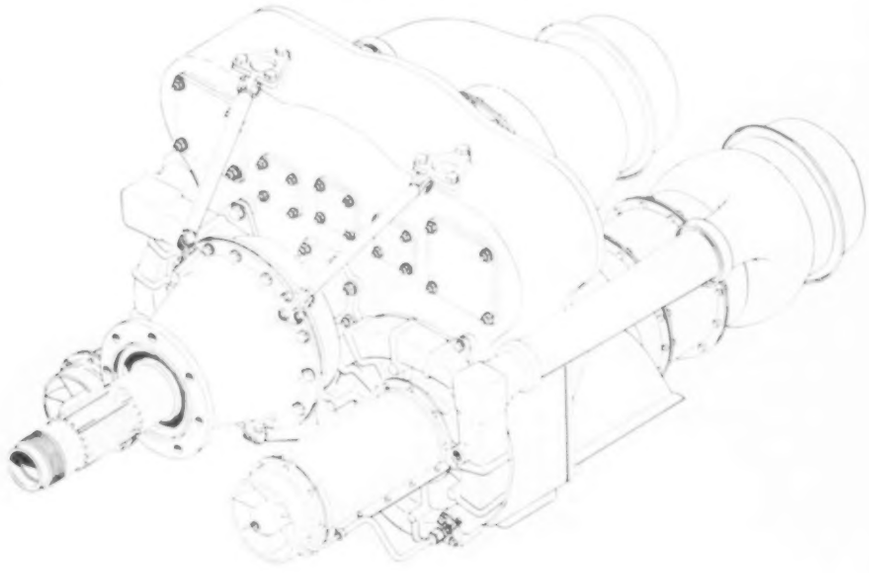


Cross-section side view shows T-63 propeller shaft and gear box atop turbine, with air intake at left, combustion chamber at right and downward exhaust at center. Package is 38.5 ins. long, 15.8 ins. wide, 19.5 ins. high, weight is 110 lbs.

250-hp. Allison T-63 for Lightplanes

PROPELLER reduction gear box is almost as large as the turbine itself in the new 250-hp. T-63 free-turbine turboprop being developed for the U. S. Army by Allison Division, General Motors. Test runs this spring and production in 1960-61 are planned. As seen in the drawings, air intake at the front through a 7-stage compressor is piped to a rear combustion chamber and gasses are directed forward through the turbine for downward exhaust at the center of the engine. The top-mounted gear box reduces 6,000-rpm. output shaft speed to 2,000 rpm. Specific fuel consumption of .70 lbs. per eshp. hour is the goal, as is pricing competitive with that of piston engines of like power; Allison has not mentioned actual price estimates. Turboprop version weighs 110 lbs., measures 38.5 ins. long, 15.8 ins. wide and 19.5 ins. high. Shaft version for copters weighs 95 lbs. is 2 ins. shorter and has same width and height. Liaison planes, light twins and helicopters will use the T-63 but are unidentified.

Twinning provides 500-hp. unit with two T-63 turbines geared to single prop shaft. Note accessory drive pads on gear box.



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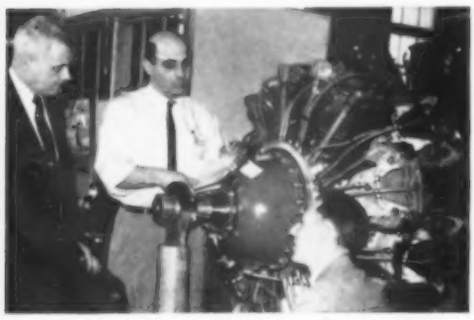

Harry Archer, Champion, discusses with Tony DellaCroces, NE Engine Overhaul Foreman, and Doug Sperry, Powerplant Engineer, how Champion solved a serious problem for Northeast.

They flew NE's first Tri-motors, blazed NE's wartime polar route to Europe, now fly NE's Florida run: Hazen R. Bean, Milton H. Anderson, "living legends" with millions of miles of experience.

A Vow — and How!

An inside report on Northeast Airlines . . . another in a series on why the world's airlines, like business fleets, use Champion All-Weather Spark Plugs

by HERB FISHER

international aviation authority, veteran test pilot, author

A quarter-century ago, a handful of aviation faithfuls congregated on a dirt airstrip under empty New England skies. A leather-helmeted young lady named Amelia Earhart chatted with some fellows named Paul Collins, Gene Vidal, Sam Solomon, Laurence Whittemore. Nearby, a couple of boyish aviators named Milton H. Anderson and Hazen R. Bean cranked away at two second-hand Stinson Tri-motors. Engines whined, roared, warmed . . . and the first load of paying Bostonians rattled skyward on wings of promise.

These visionary airline founders made a vow that August afternoon in 1933. They swore to perpetuate, always, along skyways between *any* cities, a special tradition of New England hospitality and service. They knew the destiny of their airline depended on it—during days of selling New Englanders on flying as well as later, when skies would glitter with competitive wings.

Today, a *singular institution of New England hospitality and service* spans the skies from Montreal to Miami: Northeast Airlines.

A pleasant surprise to even the most experienced travelers is Northeast's unique "*first-class*" service—wide two-abreast seating included!—at *low coach fares*. Pridefully NE acclaims it the only such service, night and day, on the east coast Florida route. Backbone of this hospitality airlift is a balanced short-haul, long-haul fleet—*truly* customized DC-6B Sunliners, zippy jet-prop Viscounts, modernized DC-3's—serving a balanced route structure with the greatest passenger density of any market in the world on its major leg.

Under four presidents—Collins, Solomon, George E. Gardner and my old friend James W. Austin—NE has grown from railroad ownership and government subsidy to major stature among the world's airlines. Northeast

Just a small fraction of the bevy of beauties enhancing Northeast Airlines hospitality aloft!

President James W. Austin, one of America's foremost transportation executives and inaugurator of many airline industry "firsts," chats with Herb Fisher alongside Northeast Viscount at Idlewild.

Night and the music—of precision maintenance at one of NE's several DC-6B and Viscount hangars. (A new $2½-million airframe and engine overhaul hangar is under construction at Boston headquarters.)

now racks up more mileage in three days than its two Stinsons flew that entire first year—and carries in a single day more than twice as many passengers as the whole whoppin' 1,904 carried the first year of operation!

Flying without communication, weather and navigation facilities, NE first linked (via cow-pasture airports) New England's far-flung population and resort centers. Then, in 1936, came devastating floods: Northeast flew mercy missions the clock around—medicine, food, evacuees. Endeared in the hearts of New Englanders, NE thus became an accepted part of the rock-bound tradition it had sworn to perpetuate aloft.

War came. Northeast immediately volunteered four-fifths of its equipment and personnel. NE uprooted materiel throughout New England, establishing airports, communications facilities and navigation aids on a pioneer North Atlantic route to Europe. Men and equipment were taxed for all their abilities acquired in combatting New England winters. Untold hazard and unsung heroism along this route—and on another route Northeast blazed across the pole—was noted by the Air Force in a special citation for "pioneering service beyond the call of duty." Stateside, remaining Northeast experts conducted advanced training schools for multi-engine pilots and navigators . . .

Northeast emerged from the war with priceless operational know-how—know-how gained from flying the world's worst weather and from perfecting maintenance techniques. With Atlas Corporation the major investor, NE spent millions in post-war expansion of equipment, routes and maintenance facilities, now, under President Jim Austin, ranking as America's fastest growing airline (increased seat-miles and equipment)—and one of the most modern. Climaxing long effort, NE recently was awarded its routes to several strategic points in Florida—and carried 100,000 passengers the first 12 months, tripling its previous traffic volume! The past year, NE added to its several new east coast maintenance stations a 38,000-sq.-ft. facility at Miami International Airport, for maintenance of four-engine aircraft . . . and at the moment is engaged in construction of a $2½-million hangar and five-story office building tying into the existing million-dollar Amelia Earhart Hangar at Logan International Airport, Boston. This maintenance structure will accommodate every size and type of aircraft going.

When NE ordered its big new DC-6B Sunliner fleet, it called for *custom-built* jobs with special features—wide two-abreast seating in coach configuration . . . 30 per cent more soundproofing than the standard DC-6B . . . dual-scope radar . . . and NE *specified* Champions as original-equipment spark plugs for the vital life-beat of the engines.

Why this?

"Because *we must* have *dependable* aircraft to meet increasingly high standards of on-time service," W. W. Mies, Assistant Vice President, Engineering and Maintenance, told me. "Our men have flown and tested them all. But Champion all-weather plugs, sealing out moisture and contamination, have proved to be the answer for firing those engines reliably—from our damp New England cold to Florida's heat."

John A. Auskelis, Superintendent of Overhaul, and Tony DellaCroces, Engine Overhaul Foreman, explained that it was DC-3 engine problems four years ago that rather dramatically brought in the Champion ¾-20 all-weather plug: To get any kind of plug reliability at all under inclement New England weather conditions, NE had been forced to operate costly air-drying systems for ignition leads and spark plug barrels. Still, expensive unscheduled plug removals persisted. A cost-reduction program spurred efforts to remedy this situation. NE tried everything—including the ¾-20 all-weather plug.

Results were so—well, *terrific!* that the same plugs were put into other aircraft, even those with low-tension ignition systems. Results here more than justified costs of ignition re-work! And since then, the lower price of Champion all-weather plugs has added to more important benefits of much greater performance dependability—and much less unscheduled removals during the 750-hour plug life.

That's why NE *ordered* Champions with its DC-6B Sunliners! Along this extended route of the most prevailing bad weather anywhere in the country, Champion is a recognized vital factor in assuring a high tradition of New England service and hospitality!

Amelia Earhart—NE co-founder, member of Board of Directors and ace promoter—prepares her plane for journey to aviation immortality. —AP

Jacqueline Cochran, world's foremost aviatrix, prepares for takeoff in jet fighter. A member of NE's Board of Directors, she does man-sized job on the ground, too.

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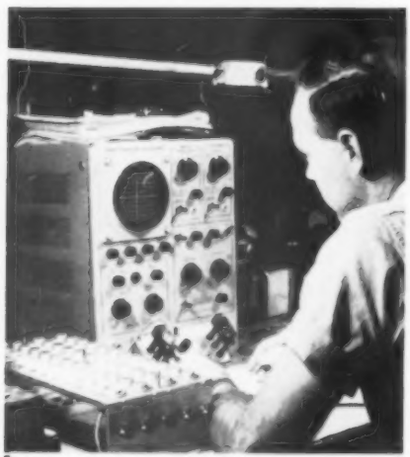

For Your Added Assurance of the Ultimate in Reliability, 100% Transistor Inspection

Transistor test equipment at the Mitchell factory thoroughly tests every transistor in every Mitchell Automatic Pilot for performance and quality. The electronic device pictured above will instantly expose the most miscroscopic impurity in the germanium crystal from which the transistor is made. It will also discover a leak in a transistor seal so small that only the lightest vapors will penetrate it. Developed especially for Mitchell by Tektronix, this device has virtually eliminated autopilot transistor failures since its installation.

ALL YOU DO IS ENGAGE YOUR

MITCHELL ALL TRANSISTOR AUTOMATIC PILOT

EXCLUSIVE — 360° AUTOMATIC COURSE SELECTOR offers completely automatic course selection and heading lock for single engine and light twin aircraft. Simply dial your heading on the fully visible azimuth ring built into the Directional Gyro. The airplane executes a standard rate turn to the heading you select—regardless of how far original heading is from the new heading. And you can dial your heading anytime, whether the automatic pilot is on or off. When the Automatic Pilot is engaged, the airplane will start an immediate turn to the selected heading.

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THE ALL-TRANSISTOR MITCHELL AUTOMATIC PILOT offers performance features usually found only on expensive equipment designed for large aircraft, yet the Mitchell costs only $2425 for the 12-volt unit, $2625 for the 28-volt system. Automatic course selector and automatic altitude control extra.

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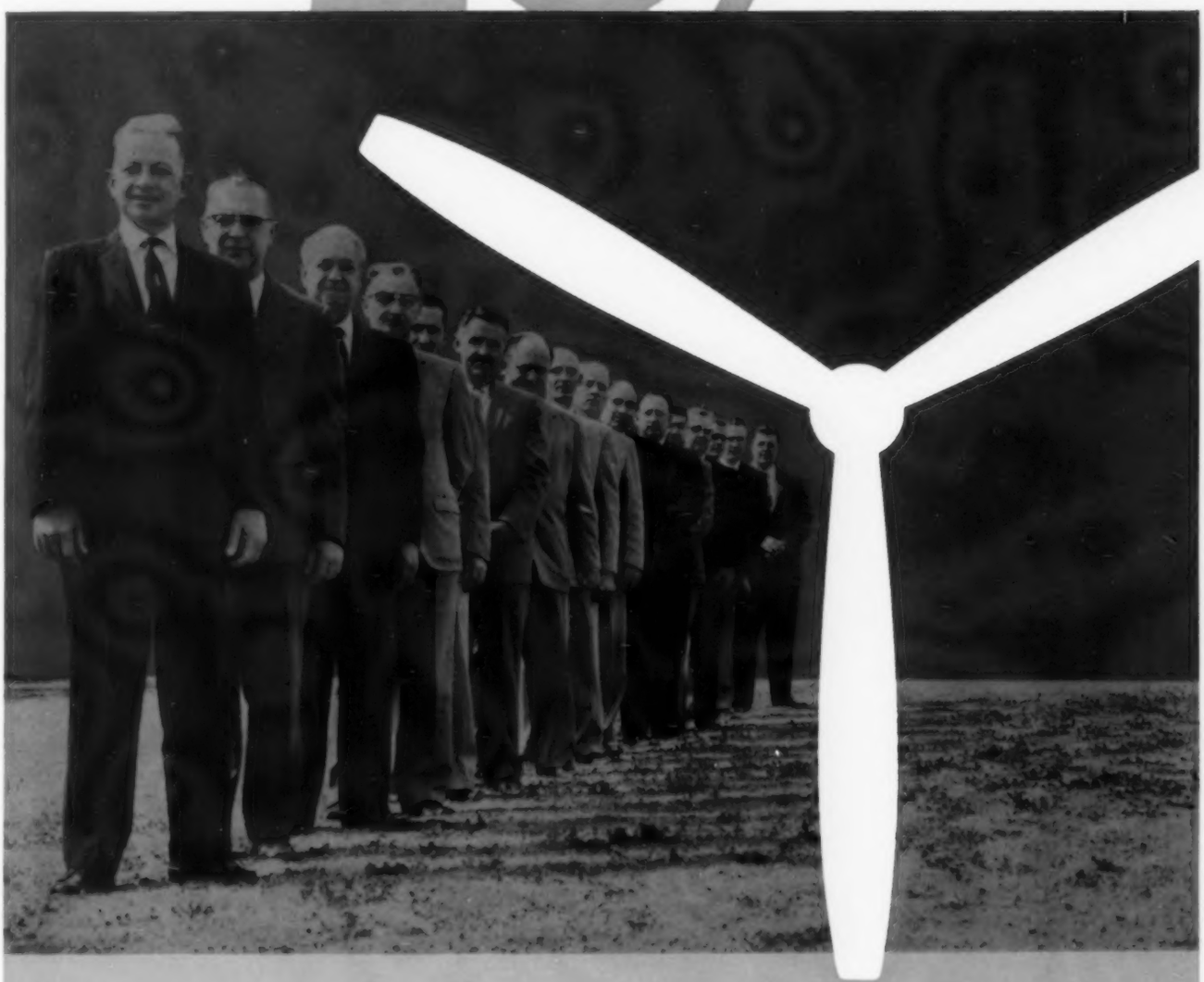

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☐	☐	Could I estimate all the possible uses of a helicopter in our kind of business?
☐	☐	Am I familiar with the Bell's range, loadability, price and operating costs?
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LOOK TO THE LEADER IN BUSINESS AIRCRAFT

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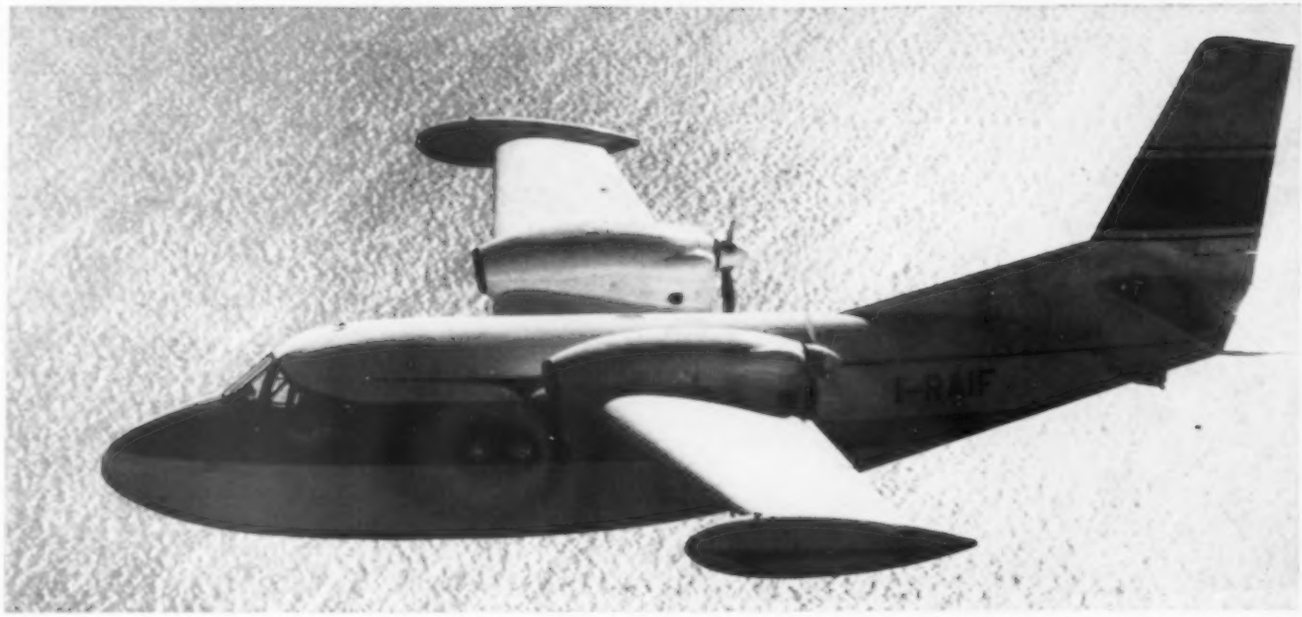


We photographed the prototype of America's newest light business twin in Italy. Tricycle Trecker-Piaggio P-166 landplane resembles the Royal Gull amphibian from which it was developed but is larger, with 6-8-place walk-about cabin. With 340-hp. supercharged Lycoming engines, it's in 200-mph. category and sells for $114,500.

—(FLIGHT MAGAZINE Photo.)

Light Twin With Biggest Cabin

BY TOM ASHLEY

FEATURING the largest and roomiest cabin in the light-twin category of business aircraft, the new Trecker-Piaggio P-166 was introduced on the market last month. It is sold in America by Trecker Aircraft Corp., Milwaukee, Wisconsin, and is custom built at Finale Ligure, Italy, by Piaggio & Co., which developed it from its famous twin-engine Royal Gull amphibian, also marketed by Trecker Aircraft in America.

The 6-8-place, tricycle-gear, gull-winged P-166 is powered by two 340-hp. geared and supercharged Lycoming engines driving 3-blade Hartzell pusher propellers. With empty weight of 5,104 lbs., it offers a useful load of 2,612 lbs. at a normal gross weight of 7,716 lbs. and Trecker says it can be certificated for a gross weight of 8,100 lbs. which would give it a 3,000-lb. useful load.

First P-166 sold in America goes to Drilling Tools, Inc., Houston, Texas. Twenty airplanes are in the first production order, with deliveries within 60 to 90 days from date of order.

Price of the P-166 in America is $114,500. Included in this price and the 5,104-lb. empty weight is elaborate

Note how entire cabin extends forward of wing and 8 feet forward of pusher propeller arc for excellent visibility and cabin quietness. Tip tanks carry 59.45 gals. each, main tanks 56.8 gals. each for 232.5-gal. supply. Fixture under belly ahead of baggage compartment is for trailing speed bomb used in flight tests.

—(FLIGHT MAGAZINE Photo.)

Trecker Aircraft's demonstrator, now touring America, is shown above. It has plush 6-place interior, 69.2-in. headroom, walk-in lavatory-buffet-wardrobe compartment at rear, large door for passengers and a second door at co-pilot's seat for crew. Note spacious legroom aisle, large windows and ease of entering cabin door.

standard equipment. Optional equipment is the most complete ever offered by a new-production light twin and includes weather-mapping radar and Junior Jato standby-thrust rocket engines.

Although it features the largest cabin available in a light twin of 680 total horsepower, it is still in the 200-mph. performance category. Top speed is 226 mph. and cruising speed is 208 mph. using 70% of power. Factory performance and specifications are given in a table accompanying this article.

Because 340-hp. engines are the most powerful now available from production for light twins, the P-166 design poses an interesting question which only the customer can answer. It is simply this: Will the market favor big-cabin advantages or smaller cabins with more speed? One or the other will have to be chosen, because King Customer can't have both with the same horsepower.

Trecker and Piaggio believe the big cabin is the right answer.

We traveled to Italy for a first-hand look at this interesting light twin when it was in the prototype stage and measured its 300-cu. ft. cabin at the Piaggio factory. We are six feet tall and could almost stand fully erect in the cabin, the headroom measuring 69.2 ins. Interior width is 61.7 ins. Cabin length is 10 ft. 2 ins. from the instrument panel back to the bulkhead behind the rear seat. This bulkhead has a walk-through doorway and a toilet-buffet-coatroom compartment extends 27.5 ins. behind it. The buffet, at a convenient height above the floor, is atop the main gear compartment of full cabin width. In this compartment, or floor well, are the struts, retracting mechanism and hydraulics, all serviceable in flight. Behind the gear well, the baggage compartment extends 4 ft. 5.2 ins. rearward, with an outside baggage door measuring 37.4 ins. wide by 23.6 ins. high for large pieces of baggage.

Significant and exclusive big-cabin features include walk-about headroom; flexible seating arrangements with aisle space; walk-in aft compartment; divider curtain or optional bulkhead to isolate the cockpit if desired; and large cabin windows with unobstructed vision because the entire cabin extends forward of and below the wing.

Normal seating in ultra-plush comfort, with pull-out tables, is for 6 people. This is readily expandable for 8 people and, with two small seats in the aft compartment, high density seating for 10 people is possible. Seven different cabin arrangements are available.

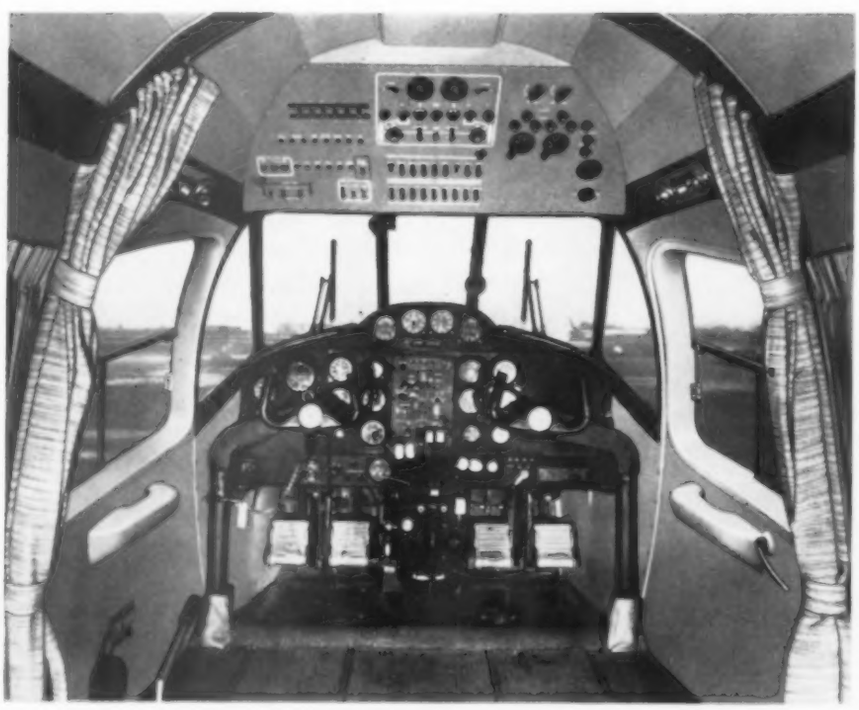
The Trecker demonstrator, with a plush Horton & Horton interior, seating six people, has two doors — one on the right up front at the co-pilot's seat and the main door on the left at the rear and in front of the wing leading edge. This is a walk-in door in the truest sense of the term — passengers neither stoop nor bend nor climb aboard because there are no obstructions whatever. Floor sill is about knee high off the ground, a la Aero Commander or Lodestar, and the door is a generous 52.7 ins. high and

Piaggio Aircraft Sales Manager Bruno Mori (left) and Chief Test Pilot Aldo Gasperi (right) are pictured with the P-166 prototype in Italy.

Trecker P-166 — Factory Data

Price	$114,500
No. Seats	6-8
Take-off hp., total	680
Normal Rated hp., total	640
Gr. Wt., lbs.	7,716
Empty Wt., lbs.	5,104
Useful Load, lbs.	2,612
Top Spd., mph.	226
Cr. Spd., 70% hp. at 12,800 ft., mph.	208
Min. SE Control Spd., mph.	85
Stall Spd., pow. off, gear and flaps down, mph.	68
Stall Spd., clean, mph.	78
Rate of Climb, fpm.	1,305
SE Rate of Climb, fpm.	263
Service Clng., ft.	27,500
SE Svc. Clng., ft.	11,500
Fuel Cap., U. S. gals.	232.5
Range, 50% METO hp. @ 15,000 ft., with 30-min. reserve, mi.	1,155
Take-off Dist. over 50-ft., ft.	1,550
Landing Dist. from 50 ft., ft.	1,312
Span, ft.-ins.	46-9
Length, ft.	38
Height, ft.-ins.	16-5
Cabin Int. Dims.—	
Length, ins.	139.7
Width, ins.	61.7
Height, ins.	69.2
Tot. Vol., cu. ft.	300.2
Util. Compt. Dims.—	
Width, ins.	59.7
Height, ins.	67
Volume, cu. ft.	76.7
Baggage Vol., cu. ft.	63.6
Total Useable Vol. of Fuselage, cu. ft.	440.5
Wing Area, sq. ft.	285.9
Wing Loading, lbs. sq. ft.	26.9
Pow. Loading, lbs. hp.	11.3

NOTES: All performance is for gross weight at sea level unless specified. Manufacturer says alternate gross weight is 8,100 lbs. at which 2,996-lb. useful load is available. Engines are geared and supercharged 6-cyl. Lycomings, Model GSO-480-B1C6.



Spacious cockpit of P-166 (right) shows tracks for seats, transport control columns, panel layout with radio at center, flat-panel windshield with wipers, overhead panel and large crew door on co-pilot's side. Main door (below) is ahead of rear seat and wing leading edge.

26 ins. wide, located just in front of the left rear seat.

As well as for its cabin bigness, the P-166 is outstanding in the completeness of standard and optional equipment available from the very outset of production. Windshield panels, for example, are flat, making practical the use of windshield wipers and anti-icing fluid. Electrically-heated glass is available. The nose compartment was designed to take weather radar installation handily. Provision with fittings was made for easy optional installation of the new Junior Jato rockets for emergency standby thrust — dual bottles fit into the belly. Transport-type controls, pedestal, instrument panel and switch panel all point to thoroughness in planning for the pilot. A 45,000-BTU heater is standard equipment and all seats, in-

Gull wing, height of pusher engines off ground, oval tip tanks and wide windshield are emphasized in this view of the P-166. High-lift wing gives outstanding short-field performance.

—(FLIGHT MAGAZINE Photo.)

cluding pilot and co-pilot, have individually-adjustable air, heat and light service.

Completely "Americanized" because its major market is in the U. S., the P-166 was developed by Piaggio to specifications formulated by Trecker Aircraft, which also provided an engineering test pilot who remained at the factory in Italy during building of the prototype and certification. Everything except the airframe is American; it uses AN standard nuts, bolts and rivets shipped to Italy.

Fuel capacity is 232.5 U. S. gals., main tanks being in the wing panels outboard of the engines. Tip tanks hold 59.4 gals. each. At 15,000 ft., cruising range is listed at 1,155 mi. with 50% hp. and 30-min. reserve.

Excellent short-field performance includes take-off over a 50-ft. obstacle in less than 1,600 ft. and landing over a 50-ft. obstacle in less than 1,400 ft., with an initial rate of climb better than 1,300 feet per minute and 263 feet per min. with one engine feathered. Service ceiling is 27,500 ft., with a single-engine service ceiling of 11,500 ft.

Minimum single-engine control speed is 85 mph., and power-off stall speed, with flaps and gear extended, is 68 mph. With flaps and gear retracted, stall speed is 78 mph.

Our introduction to the P-166 prototype was in Italy on a small mountain field about 20 miles from the factory with Chief Test Pilot Aldo Gasperi. This was strictly prototype performance — in the hands of a proud and very capable test pilot and his mechanic, Carlos Chiozzi. All of our flying was above the 200-mph. mark. Production-model performance is something else again, but this was well in advance of production airplanes.

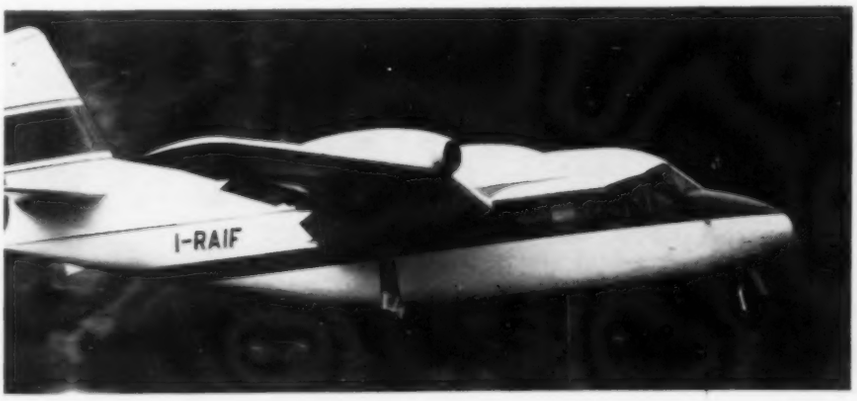
We were off the ground after a run of only 650 ft. without any wind, using 3,200 rpm. and 45 ins. of manifold pressure. Our initial rate of climb was better than 1,600 fpm. and we topped 20,000 ft. in 19 mins.

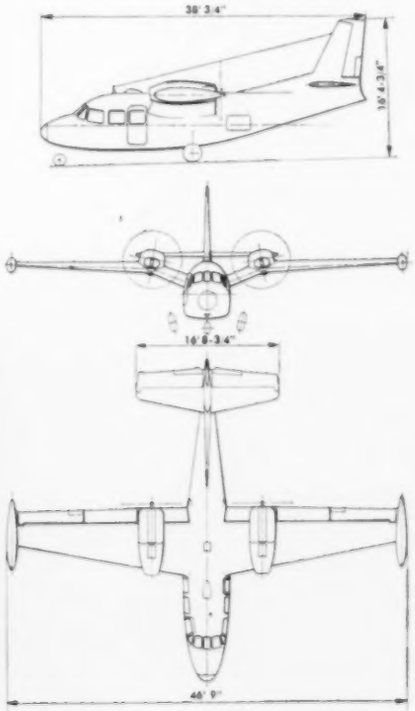
Unusually light on the controls, the P-166 has very effective trim tabs with no excessive travel. The effect of its pusher propellers is noticeable chiefly while using cruise power — with a reduction in power, the nose tends to rise, and with the addition of power, the nose tends to lower, so that there is a trim reversal in comparison with the characteristics of a tractor airplane.

Why pusher engines and gull wing? These questions will be among the first asked wherever the P-166 is shown. Here is the answer as we got it in Italy: The P-166 was developed from the Royal Gull amphibian, using the identical gull wing and power plant installation. On the amphibian, high elevation of the engines keeps the prop tips out of the spray in operations from water. This is also a high-lift wing, to minimize take-off run and for high rate of climb. A faster, straight wing with underslung and flatter nacelles would have delayed the P-166 development and would have skyrocketed its costs, so that there would have been no P-166 without the gull wing.

Pusher props have excellent advantages. They move engine exhaust and prop noise over 8 feet rearward of the

We flew prototype P-166 without tip tanks in Italy, as shown in take-off below. Tip tanks reduce speed only about 2-3 knots at cruise speed, 5 knots at low power. Planform of P-166 is shown at right.





P-166 cabin, not only giving the ultimate in cabin quietness but eliminating any interference with doors or vision. In the Royal Gull amphibian, the pusher engine installations have also proved outstanding for their efficient engine cooling. No engine heating problems have ever been experienced in these installations.

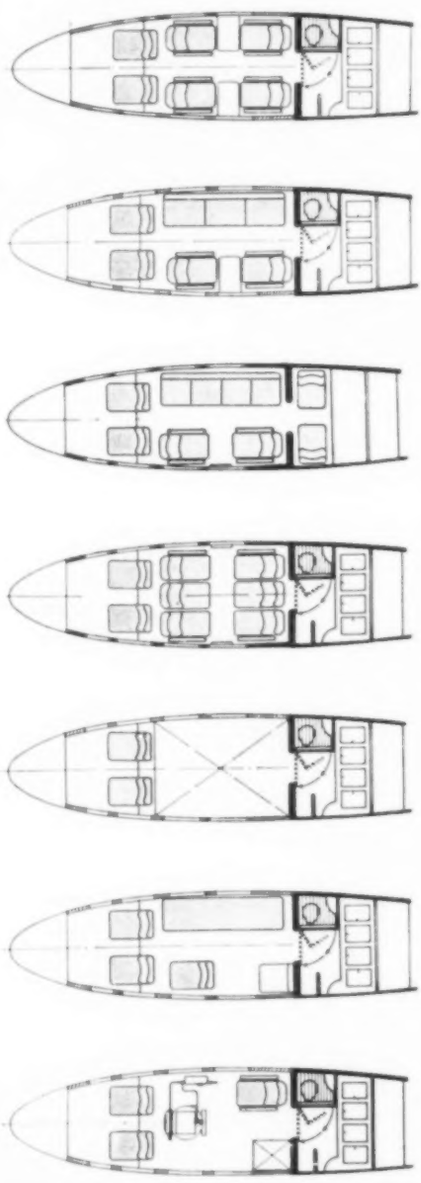
Final assembly of the Italy-manufactured P-166 and installation of American-made engines, propellers, instruments, brakes, tires and all mechanical and electrical components is performed in Milwaukee at Trecker Aircraft facilities. The airframe components are shipped by sea from the factory in Finale Ligure, Italy.

Our visit to the Piaggio factory was a revelation of high-quality, handcrafted workmanship. There is no resemblance in this plant to the crowded, fast-paced, bee-hive kind of assembly-line production which characterizes more efficient U. S. aircraft factories. Piaggio production is on a smaller scale of only about 4 civil aircraft per month. This can be doubled without much disturbance. With Piaggio, it is virtual custom building of airplanes. Each one is built up on a stationary position in the assembly bay, a group of six to twelve highly-skilled aircraftsmen working at each position. Riveting is a precision job, with a flush, clean finish, and hand-fitting of components produces a beautiful smoothness in detail. Everybody involved is a craftsman.

This factory is unlike its U. S. counterparts in another significant way — it is completely integrated with engine, propeller and airframe design, development, testing, parts manufacture and final assembly shops. During the last war, this plant produced in large numbers advance-type trainers, three-engine seaplane bombers and air-sea rescue seaplanes, and 4-engine bombers and transports. At present, it is producing twin-engine 5-place P-136 amphibians, single-engine, P-149-D trainers, P-166 twin-engine business planes, several ranges of variable-pitch, constant-speed propellers of its own design and among which is a type fitted with an interesting and new type of "elastic" coupling to absorb vibration from medium power engines having no dampers, and complete production of Lycoming engines under license.

Aircraft design, development and production are only part of many activities of Piaggio & Company, which is a giant industrial complex headquartered in Genoa and owning and operating a variety of factories in Northern Italy along the Mediterranean. Founded in 1884, it has the distinction of remaining a family-owned and operated enterprise. The firm manufactures railcars and trains, boats and outboard engines, buses and streetcars, automotive trucks and scooters, demountable bridges and hangars, rockets, fuzes and shells.

Piaggio's aircraft beginnings were in 1916 and its model room contains scores of beautiful wind-tunnel models of its own designs in fighters, racing and utility seaplanes, bombers, transports, trainers, research aircraft and civil aircraft. Within Italy the firm pioneered the all-metal monocoque structure, pressurized cabins, buried fuselage installation of air-cooled engines driving long propeller shafts, its own variable-pitch propeller designs and other Italian firsts. During the World War II its 14,000 aircraft workers produced large quantities of aircraft, engines, propellers, railway and marine equipment. Some of its plants were heavily bombed and were restored immediately after the war. One of these is the plant at Finale Ligure, a small town on the Italian Riviera, west of Genoa. The new P-166 for American businessmen is built there.

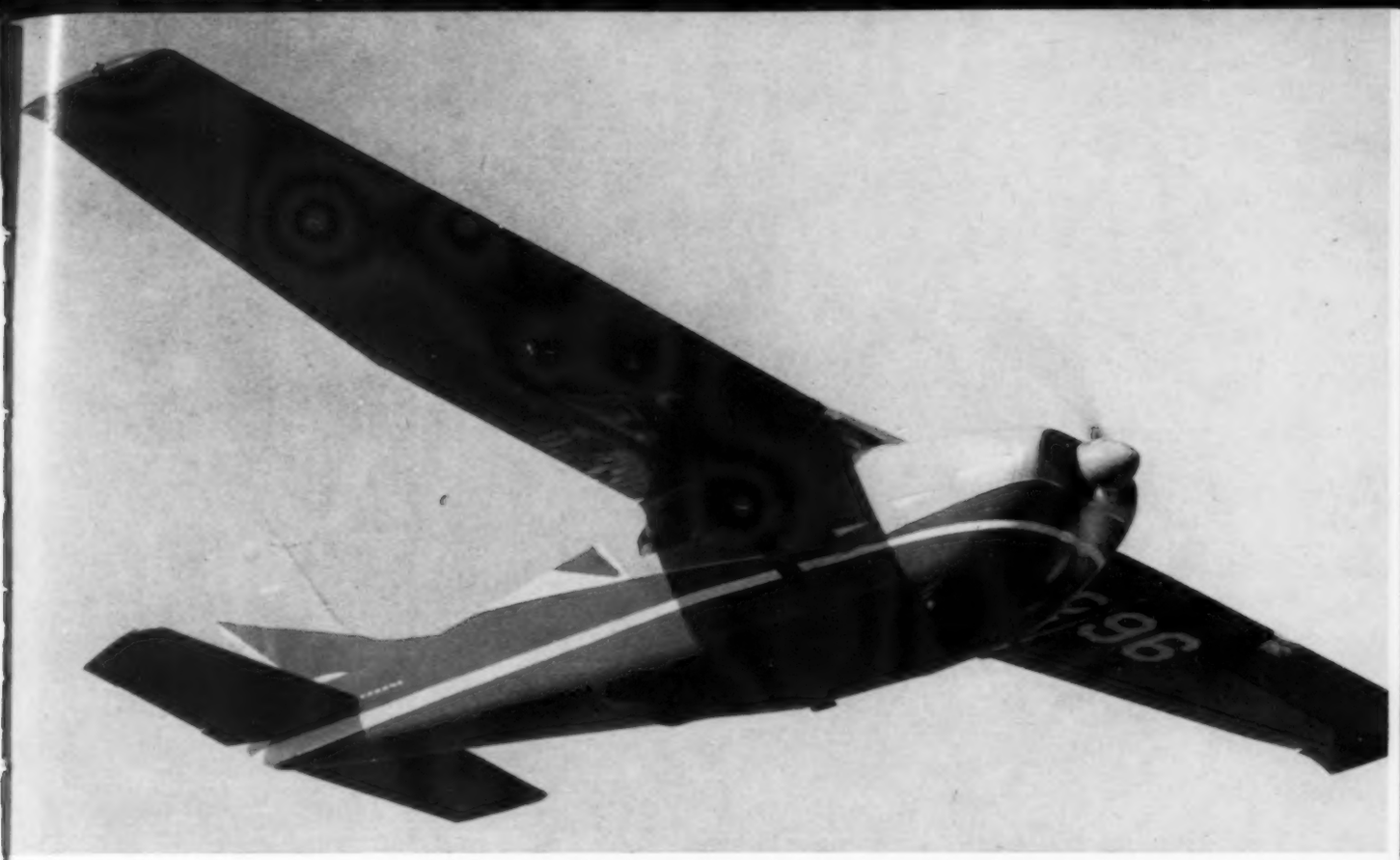


Seven seating configurations for the P-166 are shown in these floor plans, bottom one being for photographic work. Floor plan interior measurements include: Length from instrument panel to bulkhead behind rear seat, 10 ft. 2 ins.; length between rear seat bulkhead and front baggage bulkhead, 27.5 ins.; cabin width at widest point, 62.2 ins.; interior headroom at highest point, 70.8 ins.

Our hops in the new P-166 were at Finale's nearest airfield, some 20 miles back in the hills and adjacent to Villanova d'Albenga, a small, walled city built in medieval times and still a nest of rural people living and working in its narrow, honeycombed confines.

Piaggio's aircraft executives are skilled, efficient, colorful and extraordinarily interesting. They include G. P. Casiraghi, director of aeronautical activities and professionally known and respected as Professor Doctor of Engineering Casiraghi. He was formerly with Waco Aircraft in the U. S., where he was well known, moving to Italy in the 1930's with his American wife. Dr. Ing. Bruno Mori is director of aircraft sales for Piaggio and is a frequent visitor to the U. S.

It was also our pleasure to meet another interesting Italian aviation figure — Ugo Pierotti, the personal pilot of the only man we know who has an executive airplane aboard his personal yacht. This airplane is a 5-place Piaggio amphibian, carried on the aft deck of the yacht and lifted to and from the water by a crane. The amphibian was at Villanova, the only one available for us to shoot from in getting our flight pictures of the new P-166, having flown in from nearby Monte Carlo where the yacht was in port. Pierotti solved our problem by hopping us and keeping us abeam the P-166. He is executive pilot for one of the world's wealthiest and most colorful individuals — Aristide Onassis, the Greek shipping magnate. American executive pilots who think they have chores (as many of them certainly do) should consider the demands on this veteran Italian flier when he's out in the middle of nowhere and has to operate internationally from Mr. O's crane-fitted floating palace. Formerly an overseas airline captain and personal pilot for royalty, government leaders and international celebrities in a hurry to go, Pierotti does as much international flying as any executive pilot in the business.

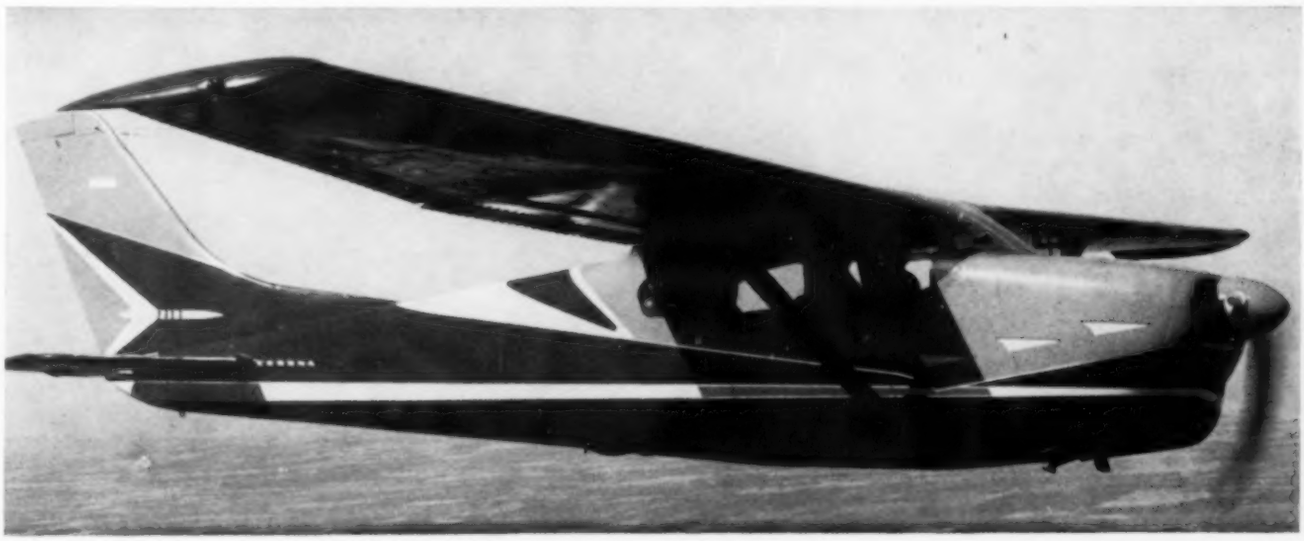


Cessna 210 has main gear in bulges beneath baggage compartment and nosewheel in fairing below propeller spinner.

Cessna 210

FIRST pictures of the new 4-place Cessna 210 show its gear retracted. With droop-tip wings and swept vertical tail, it's powered by 260-hp. fuel injected Continental engine, cruises 190 mph. and will not exceed $22,500 when introduced in September. No other details have been released. Del Roskam, Cessna vice president and commercial manager, said FAA certification was obtained in April. ★ ★ ★

Note drooping, low-drag wingtips, swept vertical tail, forward extension of nose cowling. Cessna says 210 will cruise 190 mph.



Gulf Oil selected only tried and proven modifications for four Lodestar conversions by Executive Aircraft Service. It calls the conversions Gulfstars. Basic operating empty weight, including complete radar, radio and electronic installations and all equipment, is 14,080 lbs. for 5,420-lb. useful load at 19,500-lb. gross. Cruising speed is 250 mph. at 10,000 ft., using 700 hp. from each engine.

Gulfstar For Corporate Fleet Needs

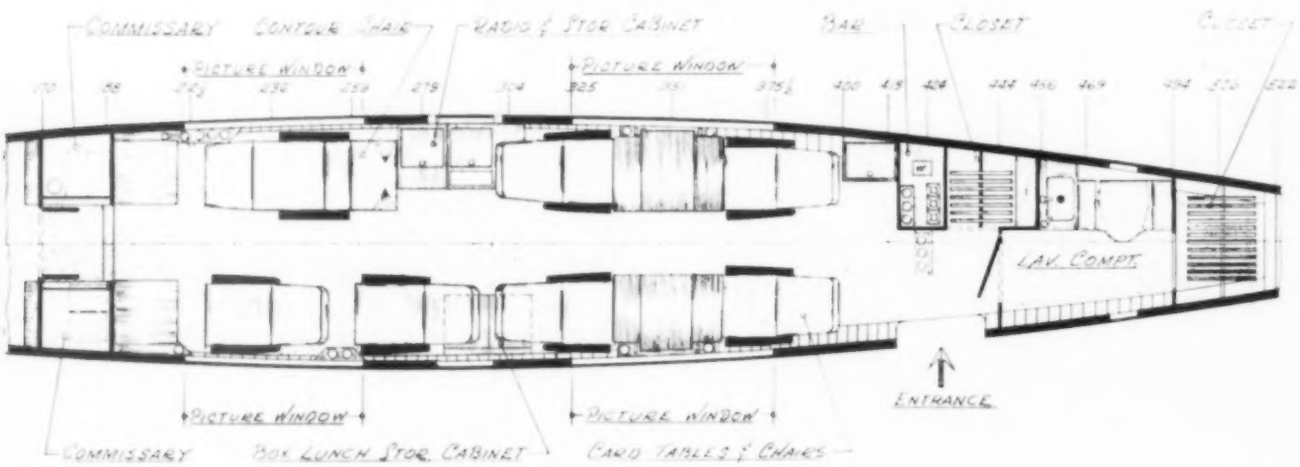
EQUIPMENT problems confronting most fleet operators of corporate aircraft for business flying have been solved in an interesting manner by Gulf Oil Corporation of Pittsburgh. It has launched a program of standardization in equipment, selecting efficiently modified Lodestars and Convairs as the two types of aircraft it will operate the next several years during a period most observers consider as an "interim" before future jet-age corporate aircraft will be proven by operations in the field.

How Gulf went about its standardization will be of wide interest to executives and pilots alike. Gulf has been operating a mixed fleet of various types of aircraft for many years. Its transportation needs have been re-evaluated so that maximum utilization and more efficient operations can be obtained — a necessity, as demands for flexible corporate transportation increase in scale. V. (Red) Irwin, promoted to Pittsburgh as director of corporate aircraft after managing aircraft operations of a subsidiary, Mene Grande Oil Co., in Venezuela for the last 15 years, formulated the new standardization plan so that Gulf can operate its aircraft in keeping with the highest standards of safety and dependability but with maximum flexibility, convenience and performance available from its fleet of aircraft and pilots on instant call to go anywhere at any time.

Analysis of the corporation's travel needs showed that the bulk of its air transportation required aircraft having a 7 to 10-passenger cabin, capable of all-weather operations over non-stop distances as close as possible to 2,000 miles and 300 mph. or more. It was not possible to obtain aircraft meeting these and other requirements completely, and Irwin surveyed equipment specifications exhaustively before settling on Lodestar modifications proposed by one of aviation's leading specialists in these aircraft — Executive Aircraft Service, Red Bird Airport, Dallas. L. V. Emery, president of EAS, had long performed modifications and maintenance to Irwin's special needs while Irwin was operating Mene Grande's aircraft in South America. Associated Radio of Dallas had also performed similar services for him in radio and electronic equipment and worked with EAS in solving Lodestar equipment problems for proposed new and efficient weight and service advantages.

The result was that Irwin has come up with a distinctive new Lodestar configuration tailored to his company's special needs and offering numerous advantages in equipment and passenger loads, performance, maintenance and servicing. This configuration involved no experimental engineering and its usual complications. It uses

Floor plan for Gulfstar, with stations indicated in measured inches, shows 7-seat cabin with commissary cabinets up front, cabin radio and storage cabinets at center and beverage bar, coatrooms and toilet in rear.



Side view of Gulfstar shows long radar nose, enlarged cockpit side windows, saddle fairing for horizontal stabilizer, and tail cone extension.

only tried and proven components which have already established their integrity in other corporate operations. It is the combination of features that is new and distinctive, and because of its completeness, Irwin refers to his configuration as the "Gulfstar." Four Gulf Lodestars are being converted to Gulfstars by EAS, the first delivery being made at the end of April.

Powered with 1,350-hp. Wright R-1820-72A engines with Hamilton Standard 33D50-6511A-12S propellers, the Gulfstar has an exceptionally light basic operating empty weight of only 14,080 lbs. This is about 800 lbs. lighter than the average Lodestar similarly equipped and the 14,080-lb. weight includes everything — completely dual radio and electronics, weather radar, new-type de-icing boots and anti-icing equipment including Sierracin electrically-heated windshields and all cabin equipment. The only weight to be added above that figure is for fuel, oil, passengers and baggage, total useful load for these items being 5,420 lbs. for 19,500-lb. gross weight. With full tanks of 644 gals. of fuel and oil, payload allowable for people and baggage is right at 1,136 lbs.

Impressive performance includes 250-mph. cruising speed at 10,000 ft. using 700 hp. per engine and consuming 117 gals. of fuel per hour. At economy cruise, burning only 80 gals. of fuel hourly for 8 hours of flight duration, the Gulfstar trues out at 217 mph. These two conditions give the Gulfstar a cruising range of 1,375 to 1,725 miles.

Flight evaluation of performance was conducted on the Gulfstar by Tex Barry of Flight Proficiency Service and the following performance is for 19,500-lb. gross weight and from that evaluation:

STALLS: With zero thrust, 1,500 rpm., 14 ins. of manifold pressure, and 2,100 rpm., 13 ins. manifold pressure; outside air temperature of 25 degrees C., 7,300-ft. density altitude — clean, 73 knots; gear down with flaps down 51 degrees, 58 knots.

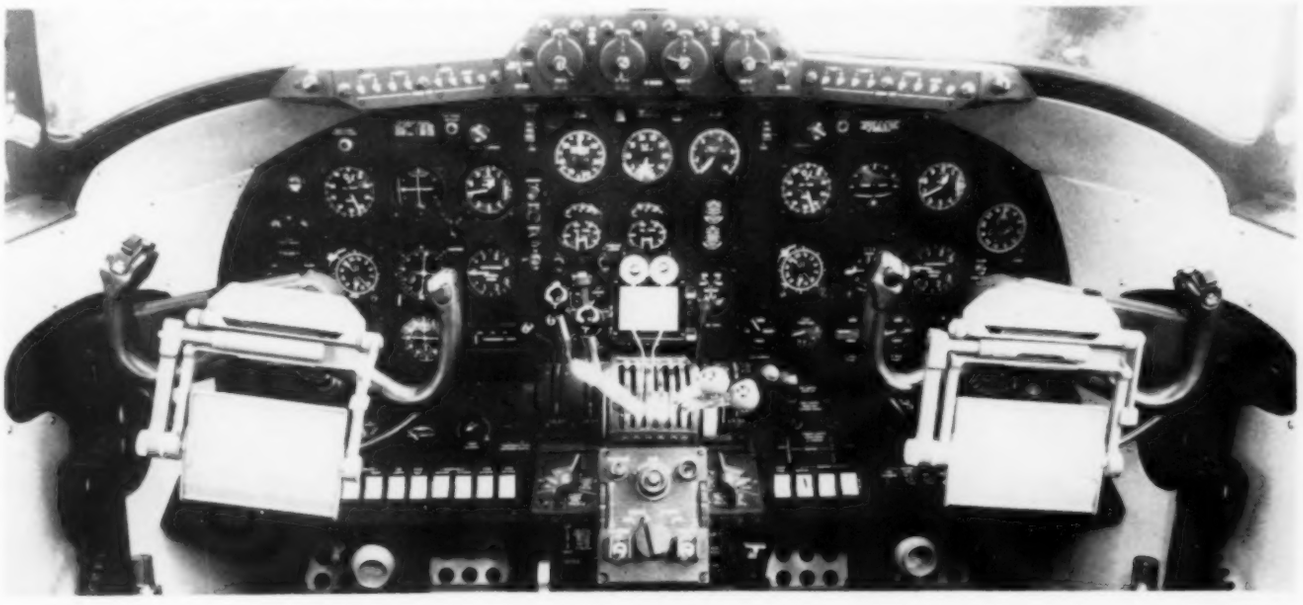
TWO-ENGINE RATE OF CLIMB: With METO power thrust, OAT 20 deg., C., 3,600-ft. density altitude — 2,000 fpm. at 110 knots, 1,600 fpm. at 120 knots and 1,360 fpm. at 140 knots.

SINGLE-ENGINE RATE OF CLIMB: With critical engine inoperative, METO power from good engine, 2,500 rpm., 44 ins. manifold pressure, OAT 25 deg., C., 4,400-ft. density altitude — gear up, 560 fpm. at 100 knots: gear down, 330 fpm. at 100 knots.

SINGLE-ENGINE PERFORMANCE AT ALTITUDE: With 2,500 rpm. and 37 ins. manifold pressure —

(Continued on page 51)

Custom panels by Associated Radio group piano key switches across bottom, selector heads on eyebrow panel and dual ADF's and all light and engine switches on overhead panel. Note Collins AP101 autopilot control head on pedestal, Convair-type arrangement of engine controls, electric trim tab buttons on control columns. Windshield is heated Sierracin glass.



Full-scale display model of new tri-turbine Sikorsky S-61 was rolled out last month, will be exhibited at Paris air show in June. Big S-61 will make first flight early in 1960, powered by three General Electric T-58-6 turbines rated at about 1,025 hp. each.

Turbocopters Reach DC-3 Level

HELICOPTERS reached the multi-engine, big-cabin, transport stage last month — a significant turning point in rotary wing progress which ushers in a completely new era in air transportation. Single-engine machines have literally performed wonders in war and peace, building the foundations of the helicopter industry and even launching remarkable scheduled airline services in New York, Los Angeles, Chicago and cities abroad. But the need for multi-engine copter transports has remained critical in both commercial and military operations because large-scale all-weather transportation cannot become a reality without copter transports combining large cabins and engine-out dependability. Both of these requirements are satisfied in new machines powered by new shaft turbines developed specifically for helicopters and becoming available later this year.

First of the big new multi-engine copter transports to be displayed is the Sikorsky S-61, powered by three General Electric T-58-6 turbines rated at 1,025 hp. each. First details were released last month. The S-61 has a 25-passenger cabin, an amphibious hull and a cruising speed of more than 150 mph.

The S-61 has the capability of becoming the DC-3 of the helicopter

Resembling a DC-3, cabin of 150-mph. S-61 will seat 25 passengers — about twice as many as copters now used by helicopter airlines. Note amphibious hull and floats, 5-blade rotors and streamlined fairing for main rotor head. Small size and light weight of turbines make multi-engine performance possible for first time in copters.

Revolutionary Sikorsky S-60 flying crane carries loads up to 6 tons externally by cable hoist, as demonstrated with bridge section and dummy of Honest John missile. Its piston engines will be replaced by turbines in later versions. Still larger flying cranes are planned by Sikorsky, which expects them to revolutionize the transportation industry.

world. Igor Sikorsky predicts helicopters will replace fixed-wing airplanes for trips up to 200-300 miles. It doesn't matter how fast fixed-wing jets can travel between cities if their passengers still have to waste as much time on the ground going to and from outlying airports as the actual flight requires — multi-engine copters operating from city centers can provide the best service between cities 200-300 miles apart.

Reaction to turbocopter availability has been immediate — Los Angeles Airways, world's oldest scheduled helicopter airliner, promptly ordered two Sikorsky S-62's for early 1960 delivery and announced its intention to buy 5 of the tri-turbine S-61's when they become available early in 1961. The S-62 is a 10-passenger copter powered by a single turbine and equipped with an amphibious hull — it will enable LAA to extend its services to Catalina Island, Lake Arrowhead, Big Bear Lake and other areas having water landing facilities but is being purchased also as an interim measure in preparation for the full-scale transition to turbocopters when the big S-61's come along.

Other commercial copter operators have taken options on S-62 deliveries. They include Petroleum Helicopters of New Orleans, Rotor Aids of Ventura, California, and Aero Service of Philadelphia.

Federal Aviation Agency certification of the S-62 and its T-58 turbine for scheduled airline operations is expected by November, 1959; commercial engines are expected to become available the following month in December, and deliveries of the complete amphibious S-62's are expected to begin early in 1960. The S-62 will thus become the first turbine-powered copter airliner to enter operation. At about the same time, first flights are scheduled for the multi-engine S-61, with commercial deliveries following in early 1961.

Sikorsky completed its full-scale static display model of the S-61 last month and will exhibit it June 12-21 in the International Air Salon in Paris.

Meanwhile, Sikorsky is already flying a two-turbine copter transport, the Navy's new HSS-2, developed for antisubmarine warfare in all-weather conditions. It is capable of taking off,

This sketch indicates what the Army's new Vertol YHC-1B "Chinook" multi-turbine transport copter of 2-3-ton capacity, now under development, will look like. Tandem-rotor "Chinook" will have side door near cockpit as well as rear loading ramp for cargo or up to 40 troops.

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Here are just a few reasons why the 1959 Bonanza is today's outstanding single-engine business plane:

1. Continuous-flow fuel injection engine for easier starting, smoother operation and complete freedom from carburetor icing.

2. Cruises 200 mph at only 75% power. Top speed of 210 mph.

3. New longer range—up to 910 miles with standard tanks. Up to 1,245 miles with auxiliary tanks.

4. Climbs at 1,170 fpm. 20,000 ft. service ceiling.

5. Amazingly low operating cost—uses less gasoline and oil than the average family car.

6. Exceptional visibility—and so quiet inside you can talk in normal tones in flight.

7. Rugged construction permits it to be licensed in a category requiring 15½% more strength than the category in which other single-engine business airplanes are licensed.

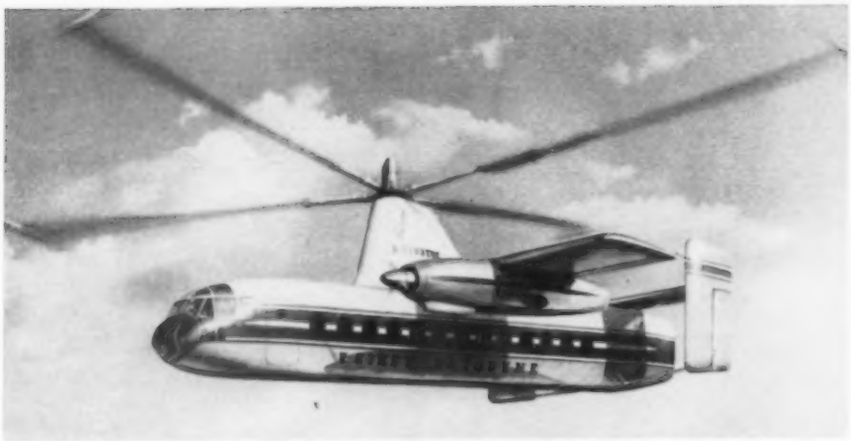
Besides this outstanding performance and unequalled comfort, Bonanzas are famous for low depreciation that protects your original investment.

See your Beechcraft distributor or dealer for a demonstration soon. Ask him, too, about low-cost financing and leasing plans, or write Public Relations Dept., Beech Aircraft Corp., Wichita 1, Kansas, U. S. A.

SUPER 18 TWIN-BONANZA BONANZA TRAVEL AIR MS 760 JET

Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS



New York Airways has negotiated letter of intent to buy fleet of British-developed Fairey Rotodyne VTOL airliners. Rotodyne will carry up to 65 passengers more than 200 mph. and costs $1,400,000 each. Engines are 5,000-hp. Rolls-Royce Tynes. Rotor has tip burners.

Bell Helicopter Corp. is in full production of utility copters at its Ft. Worth factory. New orders for $23,000,000 worth of copters include 110 HU-1A Iroquois 6-10-place Bells, powered by Lycoming T-53 turbine derated from 860 to 770 hp.

flying and landing with one engine out and at low weight.

Vertol Developing Army Transport

Biggest prize in the highly-competitive helicopter industry's military transport program has been assigned to Vertol Aircraft Corp. in the form of a contract to develop the Army's new 2-3-ton capacity multi-turbine copter. Designated as the Vertol YHC-1B, this big machine will feature tandem rotors, cabin accommodations for as many as 40 troops, rear loading ramp and other innovations. A side door is also provided behind the cockpit. The entire fuselage from the cockpit bulkhead to the rear loading ramp is available for passengers or cargo.

N. Y. Airways Buys Rotodyne

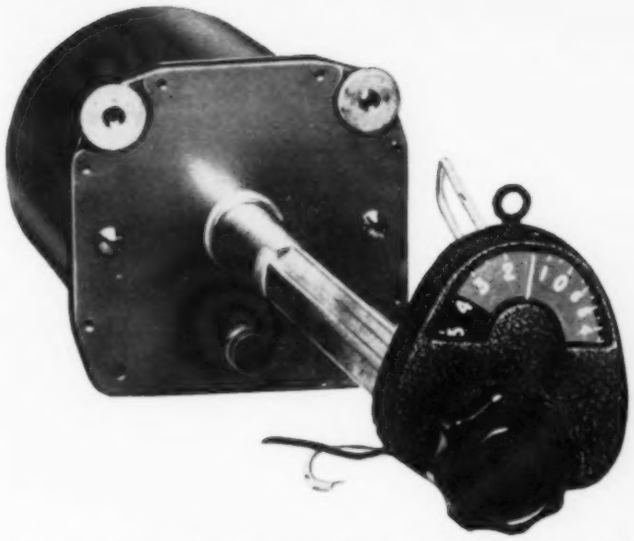
New York Airways has signed a letter of intent covering the right to purchase 5 Fairey Rotodyne VTOL airliners, developed in England. These will be 65-passenger transports, powered by two Rolls-Royce Tyne propjet engines of 5,000 hp. each. The engines drive propellers for forward speed and provide compressed air to rotor-tip burners for vertical flight. Cruising speed will exceed 200 mph. and range will be up to 650 miles. Cost of the 50,000-lb. Rotodyne is about $1,400,000 each. The New York Airways agreement calls for deliveries by early Spring of 1964. Kaman Aircraft Corp., Bloomfield, Connecticut, are sales and servicing agents for the Rotodyne and are licensed to manufacture it in the U. S.

Production for Bell Turbocopter

Bell Helicopter Corp., Ft. Worth, will produce 110 turbine-powered

(Continued on page 50)

NEW MODEL OF CESSNA CH-1C UTILITY HELICOPTER incorporates inherent stability characteristics comparable to those of fixed-wing aircraft, qualifying the rotary-wing Cessna for instrument flight operations without the necessity for complicated electronic stabilizing devices. Lateral stability is achieved through a mechanically-driven gyro which inputs a control force to the rotor control system proportional to the roll rate and displacement, while a new symmetric-section horizontal tail surface improves longitudinal stability and is combined with a g-sensitive unit to stabilize any longitudinal oscillation. New tail rotor design has center of pressure on pitch change axis for improved directional stability. Powered by a supercharged Continental engine providing 270 net horsepower, it has 3,100-lb. gross weight, 2,050-lb. empty weight, 90-gal. fuel capacity for up to 5.15 hrs. of duration, 80-105-knot cruising speed and 950-fpm. rate of climb.



New automatic altitude selector (above) and automatic course selector (right) for transistorized Mitchell autopilot are simple to operate. Knob connected to a bellows positions pointer on desired altitude, while knob on gyro rotates exposed azimuth ring to desired heading. Autopilot then takes aircraft at normal rate of climb, descent or turn to selected altitude or heading and holds it there.

Altitude And Course Couplers For Low-Cost Automatic Flying

AUTOMATIC altitude and course selector accessories have been perfected for the lightweight transistorized Mitchell autopilot and deliveries began in May. The new units provide the closest approach yet to low-cost, simplified automatic flying for small planes and light twins.

The Mitchell Automatic Course Selector, built into the directional gyro, has an azimuth ring with which desired headings are selected by turning a knob. Turns are not restricted to a few degrees at a time — the autopilot automatically turns the aircraft at a normal rate to any new heading selected and then holds the heading.

The Mitchell Automatic Course Selector has a pointer on a knob with which the desired altitude is dialed, after which the autopilot automatically climbs and descends the airplane at a normal rate to the altitude selected and then holds that altitude.

Mitchell Industries describes the advantages of the new accessories by outlining the following typical flight situations:

Suppose, for example, the pilot plans a cross-country trip for a starting leg of 210 degrees and a cruising altitude of 5,500 ft. Before take-off, he dials 5,500 ft. on the altitude control and a heading of 210 degrees on the course selector. After take-off is completed,

Faulty transistors are eliminated by triple-testing with this special device developed for Mitchell Industries. It detects impurities in germanium and exposes microscopic leaks. Each transistor in every Mitchell autopilot is tested three times under varying conditions with device.

he engages the Mitchell autopilot. The airplane automatically assumes the proper trim for normal climb and automatically begins a normal rate turn to the 210-degree heading, even if the heading is 180 degrees from center. The pilot is thus free to navigate, operate radios and watch for other aircraft.

As the 210-degree heading is reached, the autopilot automatically locks onto it and the airplane holds it. Ditto for altitude — when 5,500 ft. is reached, the autopilot automatically trims to cancel the climb and to hold the altitude at 5,500 ft., with the pilot adjusting cruise power as desired.

If the pilot finds an unfavorable wind at that altitude and decides to seek better conditions at 3,500 ft., he simply dials for that altitude, sets his power for a let-down, and the autopilot immediately begins descending the airplane and levels it off at 3,500 ft. If the pilot wants to descend or climb at higher rates, he turns off the automatic altitude control, selects his rate with the autopilot pitch control, and turns the altitude control switch back on when the airplane reaches the desired altitude — the airplane auto-

(Continued on page 50)

Uncle Sam's first jet primary trainer is the Temco TT-1 Pinto and the Navy is operating 14 Pintos at Pensacola in a new curriculum starting cadets out on the jets. With a 920-lb. Continental J69-T2 turbojet, it stalls at 62 knots and cruises at 235 knots.

Jet For Beginners

BY GEORGE E. HADDAWAY

AN orientation flight in Temco's TT-1 "Pinto" jet trainer last month was an experience worth recounting. Only on one other occasion have we had the privilege of "small" jet flight — that in the 4-place Beech Aircraft MS-760 developed in France.

The Pinto is a two-place tandem trainer powered by Continental's J69-T2 jet engine with a rated thrust of 920 pounds at sea level. It's the first primary jet trainer ever used in the U. S. The Navy has fourteen Pintos at Pensacola in a brand new curriculum that starts the cadets out from the very beginning with jet power, precluding the necessity of tedious transitional work into basic and advanced training from propeller driven trainers. The first Navy cadet under the new program made his solo flight in the jet trainer March 13.

While the smooth swoosh of jet flight projects you into an entirely new world of transport and you sit there impressed with vibrationless power you're not accustomed to, there's a strong feeling of kinship with flight in another era almost forgotten now — the days of the open cockpit airplanes when nearly every excursion aloft included acrobatics of some sort. That was *real* freedom. Methinks a measure of it is returning with the little jets and that was the main impression from our introduction to the Pinto.

To advance this thinking a little farther along the road we wondered what it would cost for Temco to build a commercial model of the TT-1. Should the military buy a hundred or so of them, we mused, perhaps the cost could be cut to a reasonable figure and some commercial operators could go in the jet training business. Very few civilian pilots have ever been in a jet. There are several hundred thousand of us and even though it might never lead to ownership of a jet-powered private plane, surely many of us would pay a handsome price to take a few hours of instruction just for the experience. It's something worth thinking about.

First Navy cadet making all-jet solo in primary training is Earland R. Clark of Stroudsburg, Pa., shown in his Pinto being greeted by Rear Admiral J. M. Carson at Saufley Field, Pensacola.

Stick control and maneuverability make it a case of love at first flight in the Pinto. We talked our instructor into some didoes that included stalls, spins, loops and rolls, plus "carrier" landings. With the exception of hypersensitive response from the slightest rudder or stick movements and the rapid acceleration or deceleration from throttle response, you don't get any feeling of unconventionality. Actually you tell yourself, "This is pure flight — almost as pure as the kind you get in soaring."

As a trainer Temco naturally made no attempt to produce a cross-country airplane out of the Pinto. Maximum range is 280 nautical miles and minimum endurance is 1.5 hours. She cruises along at 235 knots and stalls

(Continued on page 50)

NARCO SCORES ANOTHER IMPORTANT BREAKTHROUGH

ALL-CHANNEL

Sapphire

1016A

VHF RECEIVER-TRANSMITTER

with TRANSISTORIZED POWER SUPPLY

SAPPHIRE 1016A IS CAA TSO'd for scheduled airline use. Unitized construction permits rapid disassembly and unusual accessibility for servicing. Panel-mounted control switches provide crystal controlled frequency selection for SCS, DCS, or random cross-channel operation. Provision included for simultaneous channeling of glide slope receiver when used for ILS. Unit weight 22 pounds; antenna 3.5 pounds.

SAPPHIRE 1021 90-560 CHANNEL VHF RECEIVER. The receiver unit of the 1016A is now offered as a separate all-channel receiver with transistorized power supply in a short-height ½ ATR unit. When coupled with VOR/LOC converter, permits rapid, precise crystal controlled tuning to all NAV as well as COMM frequencies. Designed especially for the remarkable "2½ Sapphire" system, that gives unusual NAV/COMM flexibility and rapid switching of functions to relieve cockpit load.

MORE POWER, LIGHTER WEIGHT, SMALLER SIZE AND EVEN GREATER RELIABILITY have been engineered into this new Sapphire 1016A VHF communications unit. Thanks to the development by Narco of a revolutionary transistorized power supply, this latest addition to the popular Sapphire series of airline-quality equipment is more than ever the logical choice for airlines and executive aircraft users for an all-channel VHF communications unit.

The Sapphire 1016A provides you with a 90 to 360-channel transmitter with greatly increased power covering every channel with 50 kc spacing between 118 and 135.95 megacycles; and a 90 to 560-channel receiver covering every frequency from 108 to 135.95 megacycles, with the all-important advantage of permitting crystal controlled tuning to VOR/LOC navigation frequencies.

Sapphire 1016 series equipment is in scheduled airline use, has been re-specified for the U. S. Air Force's Cessna L-27's and is in use in hundreds of corporate aircraft.

You'll select the Sapphire 1016A because it provides you with all-channel transmission, all-channel reception both NAV and COMM, because it's years ahead in design and reliability, because it's CAA TSO'd for airline use and because it's sensibly priced. See your Narco dealer or write for new brochure.

New! Send for brand-new booklet describing operation of the "Two and One Half Sapphire System."

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National Aeronautical Corporation, Fort Washington, Pennsylvania

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Sapphire 1016A

90/360-CHANNEL TRANSMITTER
90/560-CHANNEL RECEIVER

HERE'S THE SIGN OF THE FINEST SERVICE FOR YOUR PIPER AIRPLANE

Piper has established a world-wide network of Factory-Certified Service Centers to assure you of the finest service possible for your Piper airplane.
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UNion 3-3621 *UNion* 3-5394
Gallup, New Mexico

BROWNING AERIAL SERVICE
Municipal Airport
P. O. Box 1173
HOmstead 5-1728
Austin, Texas

DES MOINES FLYING SERVICE, INC.
Municipal Airport
ATlantic 8-2218
Des Moines, Iowa

ELLIOTT FLYING SERVICE, INC.
Davenport Municipal Airport
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2-2689
Davenport, Iowa

EXECUTIVE AIRMOTIVE, INCORPORATED
Stewart Air Park
P. O. Box 70
GArfield 8-3581, *GArfield* 2-7277
Parkersburg, West Virginia

J & J AIRCRAFT, INC.
Sarasota-Bradenton Airport
821 *General Arnold Road*
ELgin 5-6868
Sarasota, Florida

KEN-MAR AIRPARK, INC.
Ken-Mar Airpark
Box 2667, *University Station*
MUrray 3-6589
Wichita, Kansas

LOUISIANA AIRCRAFT
Downtown Airport
P. O. Box 1428
WAlnut 1-9618
Baton Rouge, Louisiana

PIEDMONT AVIATION, INC.
Smith Reynolds Airport
PArk 5-0511
Winston-Salem, North Carolina

RED AIRCRAFT SERVICE, INC.
Broward County International Airport, Building 78
JAckson 3-9624
Fort Lauderdale, Florida

SOUTHERN FLIGHT SERVICE, INC.
Douglas Municipal Airport
P. O. Box 1211
EXchange 9-6374
Charlotte, N. C.

SPARTAN AIRCRAFT COMPANY
Aviation Service Division
Tulsa Municipal Airport
TEmple 5-4491
Tulsa, Oklahoma

ST. LOUIS FLYING SERVICE
Lambert Municipal Airport
Box 6067, *Lambert Field Station*
PErshing 1-0450 & *PErshing* 1-1770
St. Louis, Missouri

You'll Never Know...

...HOW PERFECT FLYING CAN BE UNTIL YOU FLY AN AutoFlite PIPER

If you think flying is the simplest, most efficient means of travel, you'll be doubly convinced when you fly an AutoFlite Piper, equipped with the sensational Piper AutoControl. This simple, ruggedly built, completely transistorized automatic flight system just about eliminates whatever work there is in flying.

But you simply can't appreciate how much it means until you take a cross-country flight in an AutoFlite Piper. Once you're airborne you turn the flying duties over to AutoControl. Make automatic turns, fly straight as an arrow with the Heading Lock engaged.

Regardless of your flight experience you'll welcome AutoControl.

If you're just a beginner, cross-country flying is so much simpler. No wandering off course while you're checking your map or working the radio. Plenty of time to figure out where you are and where you're going.
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Find out for yourself, fly an AutoFlite Piper.
And be prepared for a welcome surprise.
Piper AutoControl adds only $750 to the price. It's offered as standard equipment in the AutoFlite models of the Apache, Comanche and Tri-Pacer. See your Piper dealer, or write for brochure.

"It's the best improvement in flying I've seen in a long time," says Max Conrad, veteran ferry pilot with more than 50 trans-Atlantic crossings (mostly in Pipers) to his credit. "All the recent Piper Apaches and Comanches I've ferried to Europe have been AutoFlite models. I can't get over how smoothly the AutoControl works and how dependable it is. I think automatic flight is as important and useful as an altimeter for any pilot."

Write for brochure on Piper AutoControl, Dept. F-5.

PIPER AIRCRAFT CORPORATION / LOCK HAVEN, PENNSYLVANIA

ATTRACTIVE LEASE AND FINANCE PLANS

Our Disappearing Airspace

As Seen By Military, Airlines And General Aviation

INTERESTING views on airspace utilization problems were expressed by spokesmen for the Air Force, the airlines, general aviation and the Federal Aviation Agency in a symposium conducted by the National Pilots Association at last month's World Congress of Flight in Las Vegas, Nevada. A roundup of the main points stressed by these spokesmen follows:

Military Needs

AIRSPACE Problems Resulting from Military Needs" was discussed by Col. Joseph Ruebel as a replacement for the chief of the flight division, directorate of operations, USAF headquarters. His main point was to familiarize others with the very high performance of Air Force aircraft and thus seek a better understanding of the necessity for extra precautions as reflected in airspace requirements.

Jet interceptor climb corridors follow a standard configuration of a conical-shaped controlled restricted area oriented with the runway with a maximum width of about 4.5 miles and extending to 27,000-ft. altitude. These are designed to permit interceptors to reach altitude without delay in scrambles. They are located in heavily populated areas for air defense purposes and conflict with the normal use of associated airports and runways. As an example of interceptor performance, rate of climb is such that an altitude of 36,500 ft., or about 7 miles, is reached in less than 2 minutes from a standing start on the ground. Angle of bank is limited during such maximum performance and radius of turn is necessarily large. Thus the climb corridor must be straight and short; it cannot be "bent" or substantially modified.

In the matter of segregated training areas, the use of jet aircraft has at least tripled what used to be considered reasonable airspace requirements. Areas must remain near training bases because of high fuel consumption of about 325 gals. hourly. Using ANC instrument separation criteria, for example, the T-6 trainer was entitled to about 200 sq. mi. of area at a given altitude, but a T-33 under the same criteria is afforded a minimum of 620 sq. mi., and a B-47 (or a 707 airliner) at 30,000 ft. on an IFR flight plan sits in the middle of an 1,800-cu. mi. block of legal airspace. In the vicinity of Webb and Reese Air Force Bases near Lubbock, Texas, where the first of the newly-established segregated training areas has been established, the two bases generate over 500 sorties daily and 23 airways cross the area.

Altitude reservations, principally for about 18% of Strategic Air Command's training operations, are required because KC-97 piston-engine tankers are still used and must operate at lower altitudes than those used by new KC-135 jet tankers which are replacing KC-97's as rapidly as possible. Complexities of the mechanics involved in a mid-air refueling demand more than ordinary space precautions. As an example, imagine driving downhill and receiving fuel from a nozzle with 16 ft. of separation and allowed about 30% of lateral and vertical travel. As you take on fuel and become heavier, you have to add power. So you become preoccupied and are incapable of much evasive action. It normally requires about 225 miles to rendezvous, hook up and refuel. These refueling operations must and do cross a number of airways.

Space required for gunnery ranges has increased greatly because of high performance of aircraft. Newest aircraft can not remain in the Yuma, Arizona, range, measuring 30 to 60 miles, even in a constant turn at its operational altitude. The longest axis of a standard holding pattern at 10,000 ft. is 16.5 nautical miles but above 29,000 ft. it is 49.5 nautical miles. The piston-engine fighter could make numerous passes at the target sleeve inside the range but the new fighter crosses the width of the range in a little over 2 mins. Missile ranges must be large because, for example, some missiles home on a target by a heat-seeking device so that itinerant aircraft can not be permitted in the area.

There are performance characteristics which don't call for special airspace but demand procedure planning in the interests of air safety. For example, the F-104, with wheels and flaps down, has a power-off sink rate of 11,000 ft. per min., whereas this is only 7,000 fpm. clean — the problem is for other aircraft to avoid flame-out patterns. On a 90-degree day, a heavily-loaded KC-135 jet tanker requires up to 12,200 ft. of take-off roll and the ensuing climb is very flat and time-consuming. Here, departure routes must be longer and can not become too involved in sharp turns or specified altitudes over fixes.

The Air Force can not and does not have "the slightest objection" to anyone else using any area when its operations will not endanger him, but the obstacle is communications — the Air Force has phased out of VHF communications to the point that none is available for this purpose.

From the Airline View

AIRSPACE Needs for Civil Operations — A Professional View," was discussed by J. R. Dettman, Western Region manager of the Air Transport Association. More than air safety is involved in the critical need for more efficient and effective use of the airspace — it is a vital factor in the national economy be-

cause the airplane has become the prime mover among common carriers and the aviation industry has become the largest source of employment.

Military withdrawals of the usable airspace have become very heavy. It is estimated that 42% of all IFR flight plans are military. About 240 airports are jointly used by both civil and military aircraft. Continuing military air maneuvers require priority use of blocked-off areas frequently including substantial portions of controlled airspace. These priorities are cleared through CARF, the Central Altitude Reservation Facility in Kansas City, which coordinates military areas and altitudes with individual air traffic control centers, the latter then keeping other airplanes out of the reserved areas during military use. During 1958, the average number of priority military missions which were granted blocked airspace assignments through CARF was 30 per day with a peak of 60 per day and the current average is 72 per day, consuming a tremendous amount of airspace.

Additionally, there are about 5,100 square miles of prohibited airspace through which no airline or private aircraft may fly at any time. Also, over 126,000 sq. mi. of airspace is classified as restricted areas and cannot be considered for operations on a regularly scheduled basis because prior authorization and clearance are required for flying through some of them. Military jet climb corridors, refueling areas and other military areas consume additional airspace, as do radio and TV towers. Shrinking as it is, the airspace above the 3,022,387-sq. mi. area of the U. S. becomes even smaller for jet transports, which cover 10 miles of airspace in a single minute and some new military aircraft which cover more than 20 miles in 1 minute.

Military requirements are for larger reserved chunks of airspace while civil requirements demand more usable airspace to handle the rapidly growing commerce of the air. A look at current aeronautical charts discloses that the only available routes between many major terminals are by way of extremely circuitous routings, wasting airspace and increasing operating costs alarmingly and unnecessarily. Jet transport direct operating costs per mile are three times those of the DC-3 and direct routings are highly essential. These new airliners also introduce an intolerable conflict with military operations because their operating altitudes are critical — in several recent instances jet airliners were forced to fly at undesirably low altitudes for considerable periods because more efficient altitudes were already reserved through CARF for military operations.

Special Jet Requirements

FAA Deputy Director James T. Pyle says FAA has specified certain special requirements for jet operations, including: They must be operated at all times in accordance with instrument flight rules. They must have an operating radar beacon transponder permitting FAA and Air Defense Command ground radars to monitor their flight at all times for adequate separation from other aircraft. FAA has established specific jet routes between 24,000 and 35,000 ft. and flights between these altitudes must remain on these routes. Civil operation of jets above 35,000 ft. is not permitted and operations below 24,000 ft. must follow the airways. Any deviation from specified routes or airways must be authorized by Airways Traffic Control or Air Defense Command radar.

The CAA in 1958 designated three transcontinental routes with positive control from 17,000 to 22,000 ft. — no VFR aircraft may enter or cross these super skyways without traffic control clearance. In addition, the airlines have been operating under a voluntary program of full IFR operations. Since February, 1957, all scheduled carrier flights have been under IFR control above 18,000 ft. in clear or inclement weather. In July, 1958, after CAA decided the system could handle the extra traffic, the airlines volunteered to place all flights above 10,000 ft. on IFR. Member pilots of the National Business Aircraft Association are operating under the same principle.

For some time, there has been a jet route system in operation for military use but these did not in every instance satisfy the requirements of jet airliners and agreements were worked out in late 1958 under which a radar advisory service provides separation of civil jets from all other aircraft operating above 24,000 ft. Under FAA, this system employs the available air traffic control long range radar plus radars of the Air Defense Command network and is an excellent example of civil-military cooperation — airline jets are radar monitored through the major portion of their flights. Military services have cooperated also by ordering substantial control of their flight activities — except for certain tactical aircraft on special maneuvers, military pilots are now filing IFR flight plans between 10,000 and 20,000 ft.

Airlines are currently enjoying sincere and conscientious military cooperation in specific areas but not all conflictions are evaporating rapidly. There are still substantial differences of opinion with regard to allocation of airspace. Many people in the airline industry feel the government has overspent in the allocation of restricted areas for limited military use and that the establishment of restricted areas, as we now know them, is a luxury we can no longer afford and that we must, of necessity, find ways and means for the joint use of substantial portions of airspace now within restricted areas. It will require new tools and methods which, by and large, are within the realm of traffic control items. ATC facilities must be expanded and additional capabilities must be developed through research. This latter concerns, for example, the development of a collision avoidance system. Initial effort has been concentrated on creating a proximity warning indicator but the first system effort was a failure and ten million dollars worth of airline orders had to be terminated by the manufacturer. Infra-red detection is now being worked with and the airlines have agreed to test it when developed. In late 1958, FAA awarded Bendix Radio contract for continuing development of anti-collision equipment.

All these efforts are aimed at a completely automated system of air traffic control but that is for tomorrow — for today and the immediate future everybody directly concerned with flight operations will be involved with the problem of providing more and more positive control, consistent with growing capacity of the systems and more efficient use of the limited airspace available.

Airspace Needs for General Aviation

CROCKER Snow, director of the Massachusetts Aeronautics Commission, discussed "The Impact of Airspace Restrictions on General Aviation." He stressed the point that most general aviation operations will continue for a long time to be at speeds where the "see-and-be-seen" method of collision avoidance is adequate. Consequently, in airspace used in common by fast and slow airplanes, the visibility or positive control restrictions often suggested as a partial cure for collision hazards need only be applied to the airplanes traveling at high speeds. Thus it is neither necessary, fair nor efficient to apply such restrictions to the airspace itself and therefore penalize the average pilot who is not causing the trouble. Perhaps the most efficient way to handle the problem would be to require a graduated increase of flight visibility at speeds over 200 knots, with positive control above some higher figure and a top speed limit at low altitudes.

Airport capacity has been reduced by approach, tower, ground and departure control and their often-overloaded communications channels. Small airplanes have to wait their turn to use single runways which are five

times as long as they need to be — and then tie up the whole runway and its taxiways and associated traffic pattern. TV towers have been raised 1,500 ft. and more into the otherwise navigable airspace and military and political prohibited areas, climb corridors and ADIZ's crowd in from all sides. And when the visibility drops below 3 miles, the VFR lid is lowered to 700 ft. and to the ground in control zones.

The general aviation pilot was the first to use VOR and DME — before the airlines and the military. But regardless of the equipment he carries, one person is not always enough properly to handle control instructions and communications, fly the airplane and navigate, too. The average general aviation airplane does not have the capacity to carry all the crew and equipment necessary for the most efficient compliance with all restrictions and procedures.

The average pilot needs more room, both in the air and on large terminal airports, in which he can operate with a minimum of outside control. Right now the only en route space which qualifies is from the ground up to 700 ft., except in control zones, restricted and prohibited areas. This isn't good for many reasons — it's cluttered with tall towers; it's not legal to fly over built-up areas as low as 700 ft., and our standard radio navigation system has no coverage at 700 ft. and lower.

General aviation asked the CAB to raise the floor of controlled airspace to 3,000 ft. The CAB thought well enough of the arguments to compromise, by raising the floor to 1,500 ft., effective Jan. 1, 1960, and their order also authorized the Administrator to start doing this at any time after Jan. 1, 1959, but nothing has been done about it yet. But very little controlled flying is done at 1,500 ft., or below, except when landing or taking off, and it's not nearly high enough to clear hard-to-see TV towers and permit a degree of traffic separation by direction and altitude.

Project No. 1 should be to give the average pilot at least the first 3,000 ft. above the ground for uncontrolled flight. Project 2 should be to simplify federal and state aid procedures and standards and revise local property tax statutes to encourage both public and privately-financed small airports with a single 3,000-ft. strip. Project 3 should provide separate short runways and separate take-off, landing, approach and departure patterns at large terminal airports to get the average pilot in and out more quickly without interfering with the airlines. These three projects, together with the reduction in the number and size of military restricted areas, should go a long way toward providing the average pilot with room in which to operate safely and efficiently.

Necessary controls should be tailored to permit the most efficient operation by the average pilot. Two conditions should be met — one is when he wants to subject himself to such controls and use a terminal airport and fly the airways on instruments. For this, clearance, routing and communications procedures must be made simple enough so that a part-time pilot, alone, can reasonably be expected to comply with them while flying his airplane on instruments. This may require multiple approach paths to airports and the confining of simplified IFR to the lower altitudes, and radio and navigation equipment requirements should be reasonable both in percentage of weight and cost in relation to his airplane. The other conditions is when the average pilot wants to stay out of controlled airspace. Boundaries of conrolled areas must be positively identified, so that any pilot can be expected to recognize them. Lines on a chart are just not enough. Controlled areas must be so arranged as to permit uncontrolled flight, at least at low levels, along natural flyways between terminals and by-passing large metropolitan areas. This is not the case now. It is impossible legally to make an uncontrolled flight past New York City at any altitude, if the visibility is less than three miles, without either going 10 miles out to sea or 40 miles inland to the Catskill Mountains and then there's the restricted area south of West Point to avoid.

The operating people in the FAA, the controllers and communicators, are doing an outstanding job with what they have to work with but it's not enough. General aviation hopes one of the FAA's first projects will be to study ways and means of simplifying air traffic control procedures and reducing the extent of airspace now closed to the average pilot.

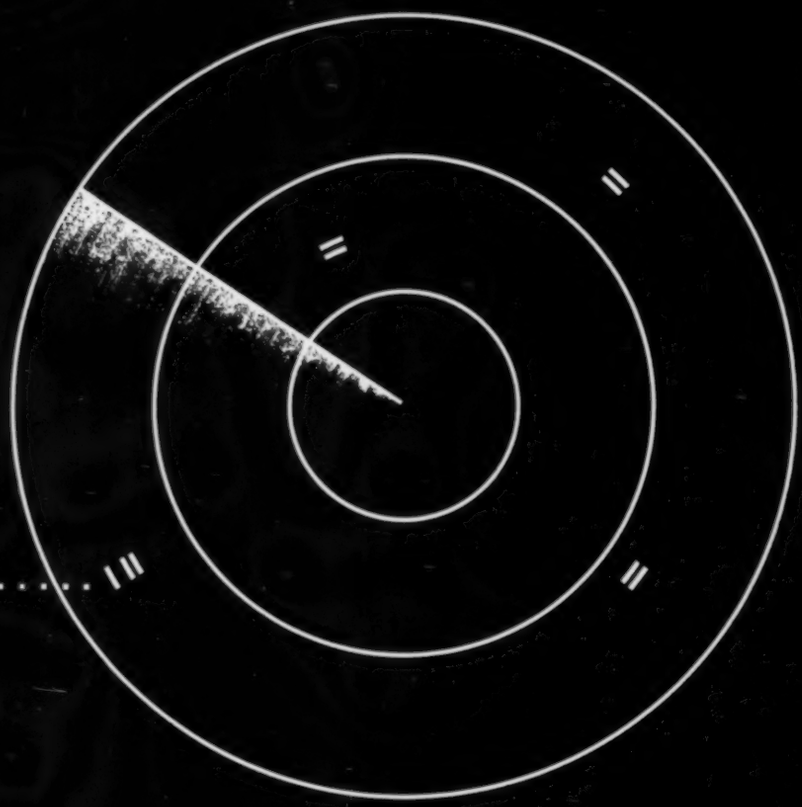
NEWEST BRITISH PROPJET AIRLINER is the large Vickers Vanguard, powered by four Rolls-Royce Tyne engines of about 5,000 hp. each. The 139-seat Vanguard cruises at 425 mph. Lower part of double-bubble fuselage carries up to 10 tons of freight.

What FAA Is Doing

BRIG. Gen. G. S. Cassady, deputy director of the Federal Aviation Agency's bureau of air traffic management, discussed general outlines of what FAA is doing for more efficient use of the airspace. Routes for civil jets are being established as rapidly as the new jet airline services are implemented, with radar monitoring and advisory service for maximum protection. Both civil and military jets using upper levels while operating on or near the jet routes must be equipped with airborne beacons (radar transponders).

To increase air traffic management capabilities, more radar and communication equipment is becoming available to the controller. Navigation aids are being installed to permit dual airway structures in congested areas. However, additional airspace requirements are generated by dual airways, radar vector procedures in and out of airports and greater approach distances. Sixteen high density air traffic zones have been designated and many more are under consideration pending a review of the program's effectiveness. FAA and FCC cooperate to keep the tall structures problem (TV towers, etc) to a minimum through rigid control, with about 14,000 "cases" processed annually of which only about 80 cases reach the Washington level and few actually become "airspace cases."

FAA is undertaking a vigorous program of reviewing airspace now set aside for special use in an effort to reduce such assignments to the absolute minimum, and is taking action to arrange for joint use of areas not required on a full-time basis by the military. Action is being taken to raise the floor of control areas as provided for by recent regulation of the CAB. FAA plans to closely monitor the system of federal airways, control areas and control zones to assure maximum utilization.



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COLLINS

COLLINS RADIO COMPANY • CEDAR RAPIDS, IOWA • DALLAS, TEXAS • BURBANK, CALIFORNIA

LARGEST SINGLE COMMERCIAL COPTER ORDER ever received by Bell Helicopters was for May delivery of 12 Model 47G-2's to Autair Helicopter Services of Montreal. D. W. Connor (above), Autair president, already has 8 Bells. Started in 1957, Autair conducts powerline patrol, resources surveys, railroad construction surveys, air supply for mines and flies tourists over Montreal. Bell 47G-2 is 3-place copter with 886-lb. useful load, 253-mi. range and can operate above 18,000 ft.

TURBOCOPTERS

(Continued from page 40)

HU-1A's and 60 smaller H-13H's under new military orders for $23,000,000 worth of helicopters. The HU-1A "Iroquois" is an 8-to-10-place utility Army helicopter powered by a Lycoming T-53 free-turbine engine of 860 hp. derated to 770 hp. at 6,400 rpm. A commercial certification program was begun for it last year and commercial orders will be accepted for it when certification is completed. Deliveries of the military version begin in April, 1960.

JET FOR BEGINNERS

(Continued from page 42)

at 62 knots with power off, gear and flaps down at a gross weight of 3,776 pounds. Normal gross is 4,400 pounds.

The Pinto probably is as rugged and as simple a trainer as you can get with jet power, which of course calls for ejection seats, oxygen equipment, speed brakes, two electrical systems and jet type canopy. Temco President Robert McCulloch came by his Scotch name honestly and he's known far and wide for giving full value for the lowest possible cost. His jet trainer is no exception what, with low initial cost, minimum maintenance requirements and built-in versatility — it boasts a "planned growth system" which extends its ability to carry more equipment if used in more advanced curriculas.

As the first original-design airplane of the Company, the Pinto is loaded with significance for Temco as well as for the Navy.

MITCHELL AUTOPILOT

(Continued from page 41)

matically reduces its rate of descent or climb to a standard rate and automatically levels off at 3,500 ft. Throughout the change in altitude, the pilot pays no attention to heading because the selected course has been held automatically all the time.

If the pilot encounters weather and decides to turn back, all he has to do is dial a reciprocal heading. This is easy because the azimuth ring on the directional gyro is completely visible and the pilot knows at a glance that the reciprocal of 210 degrees is 30 degrees. With the selector knob on the gyro, he rotates the azimuth ring until the 30-degree mark is positioned opposite the indicator at the top of the instrument. If he rotates the knob to the left in selecting the new heading, the airplane will turn to the left; if to the right, the turn will be to the right. With one selection and one continuous 180-degree turn, the airplane automatically takes up and then holds the new 30-degree heading.

During this turn, the pilot wants to change his altitude 1,000 ft. so he dials 4,500 ft. on the altitude control and the airplane automatically climbs at a normal rate to the new altitude and then holds it. All the pilot has done is to turn two knobs — the autopilot has done all the rest.

The completely transistorized Mitchell autopilot weighs only 8 lbs., exclusive of gyro instruments, and is completely mounted under the instrument panel. Its transistors require only fractional power and need no warm-up time. For either 12 or 28-volt electrical systems, the autopilot uses less electrical power than the average aircraft panel lighting system — it will operate from a battery too weak to illuminate the panel. Needing no warm-up, this autopilot takes over the moment it is engaged.

Mitchell Industries also reports it has achieved new standards in quality control. One of the new testing devices now being used has virtually eliminated all transistor failures in the Mitchell autopilot. It was designed by

Airmen's Calendar

May 16-17—Annual Klamath Falls Air Fair, Klamath Falls, Oregon.

May 20-22—2nd Annual Jet Age Airport Conference, ASCE, Shamrock Hilton Hotel, Houston, Texas.

May 22-24—Texas Private Fliers Association Annual Convention, San Antonio.

May 24—Florida Aero Club Brunch Flight to Tampa.

May 24-June 5—Federation Aeronautique Internationale Annual Meeting, Moscow, Russia.

June 5-6—Annual Meeting of the Army Aviation Association of America, Shoreham Hotel, Washington, D. C.

June 5-6—10th Annual Maintenance and Operations Meeting, Reading Aviation Service, Reading, Pa.

June 12-21—23rd French International Air Show, Paris, France.

June 14—Annual Breakfast Flight, Springfield, Minnesota.

June 17—Flying Physicians Association Alaska Air Cruise; Mark DeGroff, Director, P. O. Box 3275, Tulsa.

June 19—Flight to Alaska, sponsored by the 49er Air Cruise Assoc., from Miami; contact Harry B. Collins, 375 NE 154th St., North Miami Beach 62, Fla.

June 23-25—33rd Aircraft Distributors and Manufacturers Assn. Meeting, St. Francis Hotel, San Francisco, Calif.

June 29-July 31—National Aviation Workshop for School Teachers, Montana State University, Missoula, Mont.

July 19—Annual Dawn Patrol Breakfast and Events, Haines Airport, Three Rivers, Mich.

July 26—Oregon Centennial Air Circus and Jaycee Air Fair, Hillsboro, Oregon.

TENTH ANNIVERSARY OF PETROLEUM HELICOPTERS was marked with a recent banquet at Lafayette, La., at which R. L. Suggs, president, traced firm's growth from meagre start in 1949 as Petroleum-Bell Helicopters to present international scope of operations from Alaska to Bolivia with a fleet of 45 copters, over 60 pilots and 80-odd mechanics. Petroleum Helicopters every month flies nearly 17,000 passengers distances the equivalent of six times around the world. Harvey Gaylord, president of Bell Helicopters, was special guest and is shown at left.

Cabin scene at right is looking forward, seats reclined. View above shows beverage bar with ice chest at left and drawers beneath opened compartment having swing-out glass racks.

CORPORATE GULFSTAR

(Continued from page 35)

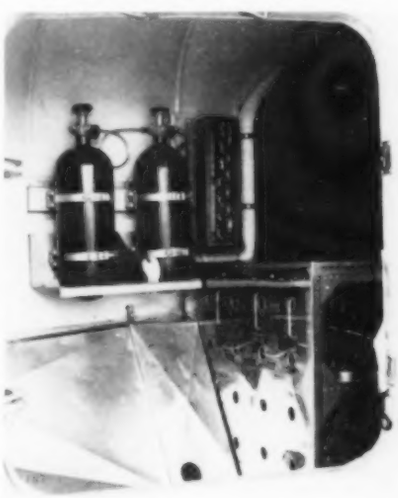
at 11,000-ft. density altitude, OAT 20 deg., C., 200 fpm. up at 100 knots; at 11,900-ft. density altitude, OAT 20 deg., C., 200 fpm. up at 100 knots; at 12,500-ft. density altitude, OAT 19 deg., C., 100 fpm. up at 100 knots; at 15,300-ft. density altitude, OAT 19 deg., C., 100 fpm. up at 100 knots.

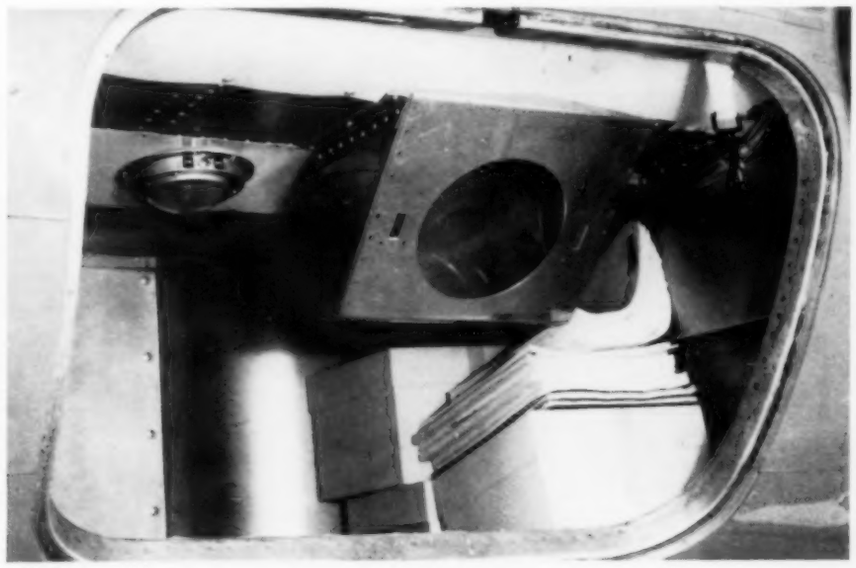
MINIMUM CONTROL SPEED IN SINGLE-ENGINE CONDITION: At 4,700-ft. density altitude, OAT 22 deg., C. — Vmc with gear down, prop windmilling, 88 knots with take-off power of 2,700 rpm. and 48 ins. manifold pressure, and 81 knots clean with METO power of 2,500 rpm. and 44 ins. manifold pressure; Vmc with gear down, flaps 15 deg., and prop windmilling, 89 knots at take-off power of 2,700 rpm. and 48 ins. MP, and 82 knots with METO power of 2,500 rpm. and 44 ins. MP.

One of the most interesting features of the Gulfstar, however, is its equipment — new, lightweight gear makes possible maximum economy in both space and weight. Installation engineering to Irwin's special requirements grouped all of a very complete list of equipment closely together in the aircraft for the dual purpose of (1) keeping wiring and cable lengths to a minimum for weight saving and (2) providing handy accessibility for ease of servicing. All of the Gulfstar's equipment is adjacent to the cockpit and panel installations — the airplane has no lengthy cabling or wiring which would be required if various equipment had to be scattered from nose to tail. Leads connecting the units are the shortest possible to achieve.

Completeness of equipment is illustrated by the following listing of the installations in the Gulfstar: RCA AVQ-10 radar, Collins AP-101E autopilot, dual Collins communications system using two 17L2's and two 51X2's, dual Collins omni system using 51X2 and 344B-1, dual Collins 51V3 glideslopes, Collins 51Z2 marker receiver, dual ADF system, using ARC-21A's, dual Sperry C4A Gyrosyn compass systems, dual Sperry C6A omni indicators, Bendix MN97 omni mag indicator, Collins 346D1 paging and radio amplifier, Associated Avionics AR100-F isolation amplifier, and other items, including custom panels and

Metal fixture in baggage compartment under cockpit (right) is receptacle for ground use of external air-conditioning hose. Photo below shows main baggage compartment with slip-out radio rack adjacent to cockpit bulkhead for short-length wiring. Oxygen bottles are above rear end of heater compartment.





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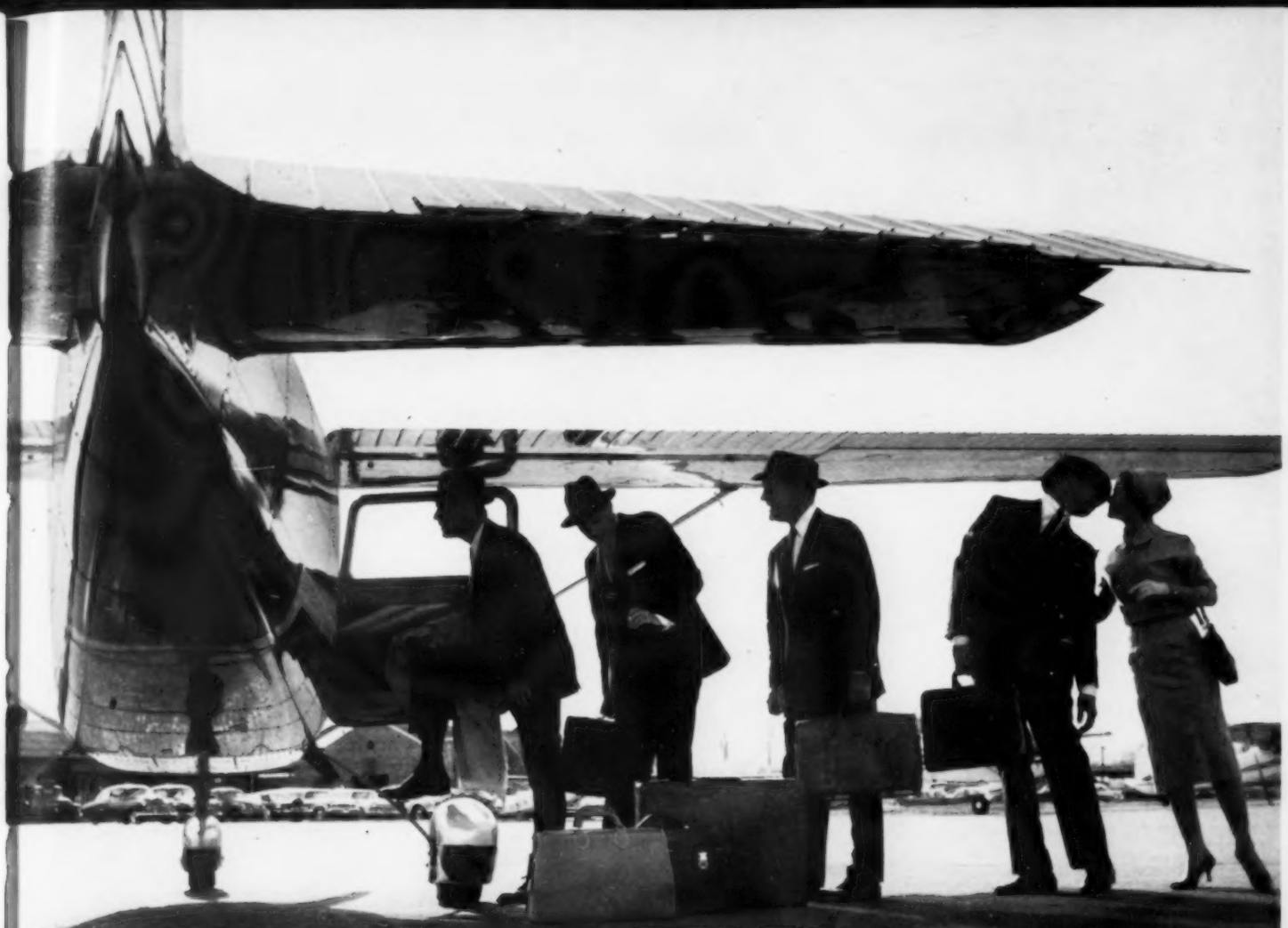

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At small-airplane cost, you can fly the big 4-place, all-metal Cessna 175—available for just $11,250 (std. equip., f.a.f. Wichita). Matching its low price is the 175's low-cost operation: 8¢ per mile—2¢ per seat mile—*including fuel, maintenance, storage, insurance, and depreciation.* Economy is a Cessna tradition. So are big-airplane features:

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BIG-AIRPLANE PERFORMANCE is assured with Cessna's 175 sq. ft. "High-Stability" Wing. Huge Para-Lift flaps—over 3,000 sq. in. surface—give top lift for take-off and maximum drag for landing. Cessna's exclusive Land-O-Matic takes the effort from landing. (Also approved for floats and skis.)

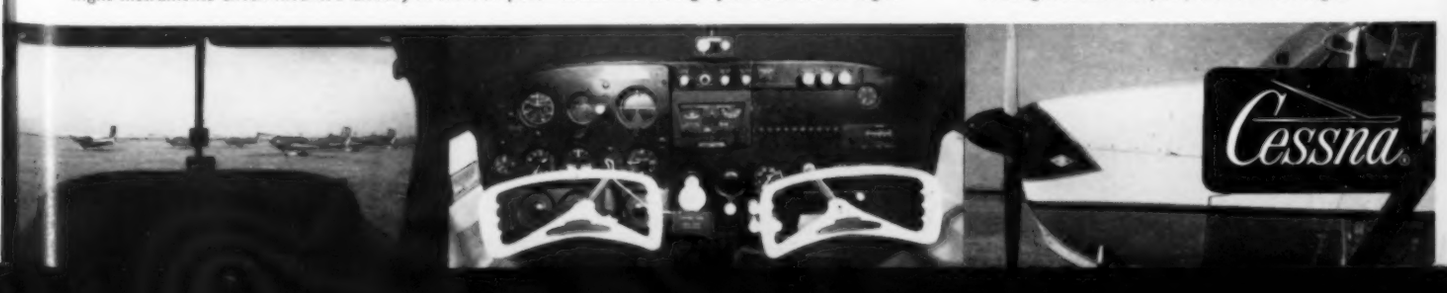
BIG-AIRPLANE COMFORT is provided by the 175's roomy, luxurious cabin with finger-tip adjustable seats. Exclusive Floating Cowl Suspension absorbs engine sounds . . . permits easy, normal-voice conversation. Two yard-wide cabin doors simplify access. Spacious luggage compartment holds 120 lbs. of baggage.

To check these and the many other big-airplane features that make the 175 your best value-packed buy, call your Cessna dealer now. (Yellow Pages of phone book.) Look at all *seven* great Cessnas. Also ask about lease plans. Or write: Cessna Aircraft Company, Dept. FM-9, Wichita, Kansas.

**Approx. 500 flight hours per year.*

CESSNA "EYES-ON-THE-ROAD" CONCEPT: Big, wrap-around windshield for full panoramic visibility . . . flight instruments shock-mounted directly in front of pilot—eliminates taking eyes from line-of-flight.

FLOATING COWL SUSPENSION floats entire cowling in rubber for quiet, vibration-free flight.



Eyebrow radio panel and overhead panels for Gulfstar are custom work of Associated Radio. Note Convair-type ignition switches overhead. Knobs on topmost panel are rheostats for lighting. Because Gulfstar has dual Sperry compasses, magnetic compass is seldom used and is retracted into overhead panel adjacent to windshield. Dual lightweight ARC ADF's are in first overhead panel.

cabin radio and multiple speakers. Almost 20 years of corporate aircraft operations, maintenance and servicing by Irwin influenced decisions in the selection, engineering and installation of this gear and its panels.

The Gulfstar received an 8,000-hour overhaul in the modification process, during which the airplane was completely taken apart for metal and skin replacement, where necessary, complete rewiring and extensive cockpit modifications. The latter is necessary in taking fullest advantage of modern equipment packages and to give the crew maximum visibility with enlarged 15 by 38-in. side windows, comfort and accessibility to all controls and services. For example, the front spar was inverted, making possible lowering of the cockpit floor 6 inches and extending the cockpit area 20 inches rearward for track-mounted long-range crew chairs and handy location of the junction box. This also permitted the installation of a folding, or retractable, radar scope in the cockpit floor between crew chairs — it is under the floor, completely out of the way, until needed, and is easily extended up and forward for efficient weather flying and terrain mapping.

Instrument panel and throttle pedestal were customized to match those used in Gulf's two Convairs, featuring standardized placement of controls and instrumentation so that crews moving from one airplane to another throughout the fleet will have minimum cockpit familiarization problems. This, incidentally, was one of several reasons for standardizing on only two aircraft types — the use of five or six or more different makes, models, sizes and categories of aircraft imposes built-in restrictions against fullest possible utilization and efficiency, not to mention maintenance and equipment complexities.

The Gulfstar cabin layout and finishing emphasize simplicity with its seven reclining chairs, two pull-out tables, forward commissary units with hot bottles and cold storage, center-cabin storage and radio cabinets and rear cabin beverage storage, coatrooms and toilet-lavatory. All fabrics were selected for easy cleaning and resistance to staining. Four 16 by 52-in. picture windows are used, other windows being 16 ins. square. These large windows, in combination with white headliner of cleanable material, provide maximum daylight illumination and an appearance of spaciousness, with excellent visibility for passengers, avoiding the ordinary Lodestar's crowded appearance.

Interesting but well-proven and accepted modifications for improved performance and appearance include horizontal stabilizer incidence change with fiberglass saddle fairing, extended tail cone and rudder spring tab kit, wing

1,500 NARCO MARK V TRANSCEIVERS have been delivered since the new all-channel radio first hit the market just seven months ago. Gil Quinby, Narco sales manager, is shown handing Mark V No. 1,500 to George Galipeau, vice president of Van Dusen Aircraft Supplies. Sales and deliveries averaging more than 200 per month for the first 7 months after introduction is a new world's record for a new business aircraft radio model. The Narco factory is now producing the model at a rate of 14 per day, six days weekly. The Mark V weighs only 9.5 lbs.

Spacious toilet room at rear of cabin has lavatory. Door leads to coatroom.

trailing edge and flap travel modification, Lear elevator trim system, radome, PacAero exhaust and carburetor heat system, Capco heavy duty gear and aluminum oil coolers. Other equipment includes Bendix fuel flow system, electric firewall shutoffs, Edison fire detector system with two-bottle CO-2 extinguisher system, Aeroquip 601 plumbing, oil quantity indicating system, 200-amp generator system, Safeather propeller feathering system, PacAero emergency fuel supply modification, manually-actuated oil shutter controls, electric auxiliary hydraulic pump, propeller vibration isolation dampeners, sealed beam taxi lights in main gear strut fairings, dual fuel system, Mighty Midget Adel selector valves, and two-bottle free-flow oxygen system.

For protection against icing, the Gulfstar uses the new fast-acting, high-pressure Goodyear type 21 boots, electrically-heated Sierracin windshields, 19-gal. alcohol system for propellers, carburetors and windshield, and individual hydraulic windshield wipers. The electric windshield draws only 11 amps but maintains 95-deg. warmth.

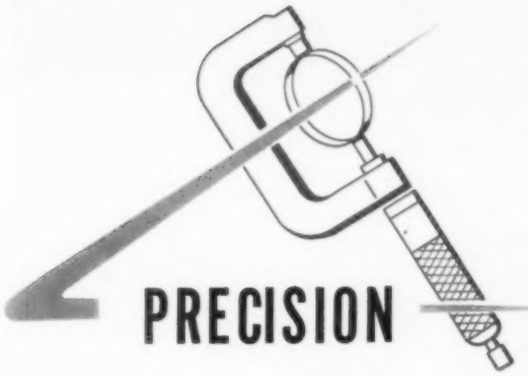
A 100,000-BTU Janitrol heating system for cockpit-cabin comfort is installed in the nose baggage compartment, with a Barber-Colman automatic control system — T.A.

MITCHELL AUTOPILOT

(Continued from page 51)

Tektronix of Dallas for testing transistors.

Mitchell's autopilot and new automatic course and altitude accessories are sold exclusively through General Aviation Supply Co., Aviation Supply Corp., the Don Horn Co., and General Aircraft Supply Corp., and their dealers and distributors.



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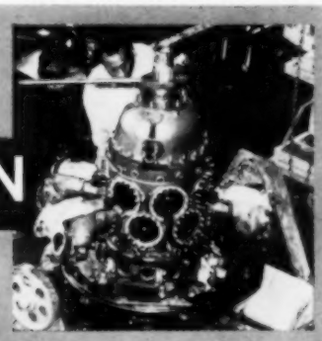

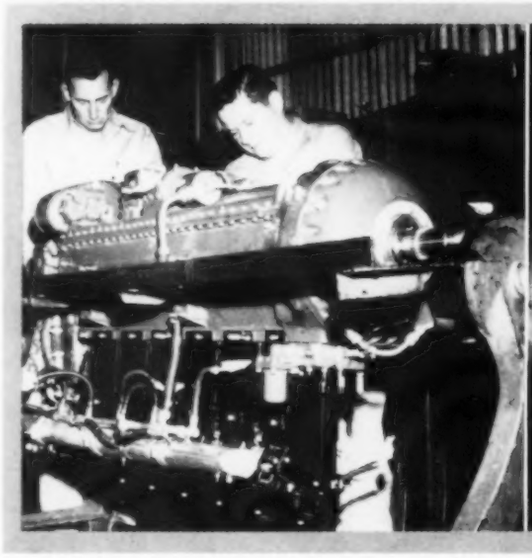

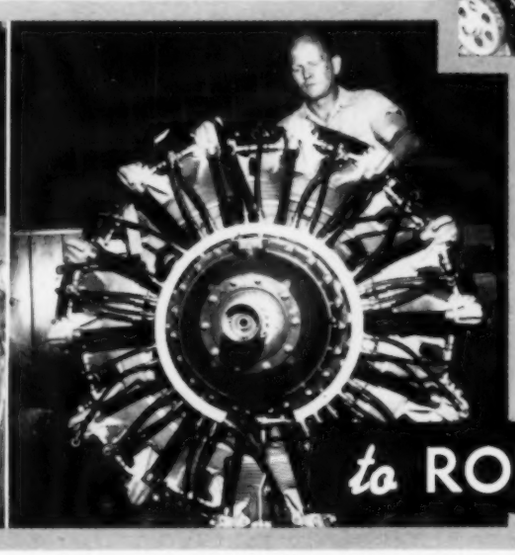

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AIR REPORT

(Continued from page 5)

version of Cessna's twin-jet intermediate Air Force trainer. The new version will be powered by new Continental J69-T-25 jet engines rated at 1,025 lbs. of thrust, up 210 lbs. from the J69-T-9 engines now used, and will have new communications and navigation equipment — Collins AN/ARC-34 UHF communications and a VHF navigation package consisting of Collins VOR-101 omni system with 51X-2 receiver, 344B-1 VOR/LOC instrumentation unit and B-7A amplifier, and an AN/AIC-10A intercommunication system including dual C-824A/AIC-10 controls. The new engines will provide increased reliability and performance, reduced maintenance and longer engine life. They are about the same size as the existing engines and will not require any major modification of the aircraft. Comparative ratings for the new and old engines include the following: Normal thrust, 880 vs 725 lbs. at 20,700 rpm. vs 21,000 rpm.; specific fuel consumption for normal thrust, 1.12 lbs. per hp.-hr. vs 1.095 lbs. per hp.-hr.; fuel flow, 225 lbs. per hr. vs 250 lbs. per hr.; exhaust gas temperature using normal power, 1,145 degs. F vs 1,060 degs. F. Aircraft gross weight is up from 6,400 to 6,574 lbs.; take-off distance over 50-ft. obstacle at gross weight is down from 2,140 to 2,025 ft.; military-power rate of climb from sea level is up from 2,350 to 3,370 fpm.; service ceiling is up from 33,400 to 38,700 ft.; single-engine service ceiling with one-half fuel load is up from 18,950 to 25,000 ft.; maximum level flight true air speed with one-half fuel at 15,000 ft. is up from 324 to 369 knots; range and cruise speed with normal power and 5% reserve is up from 731 nautical miles at 30,000 ft. and 286 knots with 3.45-hrs. endurance to 755 nautical miles at 35,000 ft., and 313 knots with 2.81-hrs. endurance; landing distance from 50 ft. is up from 2,480 ft. to 2,600 ft., and stall speed is up from 73 to 74 knots.

Tufts of yarn provide study in airflow during flight tests of Grumman's new YAO-1 Mohawk propjet Army observation airplane. Span is 42 ft., length 41 ft.

Grumman Turboprop Twin in Flight Test

AMERICA'S first turbine-powered utility twin in production began its first flight tests last month at Bethpage, New York, where Grumman Aircraft Engineering Corp. is producing nine prototype models of the 2-place YAO-1 Mohawk for the Army's use as an observation aircraft. A follow-on order calls for 35 production models.

"It more than lived up to its advance billing as an STOL airplane — she climbed like water up a straw," said Ralph Donnell, Grumman test pilot, after the first flight. The Mohawk was designed for short take-off and landing characteristics. Even though it has a 9,000-lb. empty weight and is one of the largest fixed-wing airplanes to enter Army service, the Mohawk has more than 2,000 equivalent shaft horsepower available for take-off from its two Lycoming T-53-L-3 turbine engines. This power gives it "relatively the same short take-off and landing capabilities as the Army's present lightweight, single-engine airplanes," Grumman says.

First American-designed and produced free-power turboprop engine, the 1,005-eshp. Lycoming T-53-L-3 which powers the Mohawk weighs only 520 lbs., has a small 23-in. diameter and is 58 ins. long. It passed its 50-hr. preliminary flight rating test last June and its engine-propeller compatability test last month and will soon undergo full 150-hr. qualification. Commercial engine certification will be sought in the near future.

Short take-offs and landings were designed into the propjet Mohawk. Note large flaps. Engines are Lycoming T-53-L-3 turbines, rated at 1,005 equivalent shaft hp. each.

NEW AIR OASIS COMPANY FACILITY at Long Beach Municipal Airport, California, large Cessna distributorship operated by Larry Hunt, was to have its formal opening May 16-17. One of the most modern and complete Cessna sales and service facilities in the country, the new Air Oasis layout is just south of the terminal building. It was constructed because the old operation was in the path of a new freeway.

SEVEN OPERATOR MEMBERS OF NATIONAL AIR TAXI CONFERENCE have received NASAO Safety Certificates of Merit from James E. Martin, president of National Association of State Aviation Officials. The awards are the first in a series of 100 going to NATC members completing 10,000 or more passenger miles of air taxi service during 1955-58 without an accident. The first seven recipient firms are Air Oasis, Long Beach; Alamo Airways, Las Vegas; Fisher Aircraft Co., San Diego; Hawaiian Air Tour Service; Kemp and Kelsey Airservice, Salt Lake City; Mercury Flying Service, Phoenix; and Somerset Air Service, Bedminster, N. J.

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Daily aircraft from all points in the nation stop on the ramp of SOUTHWEST AIRCRAFT, INC. for service. Whether the need is for a windshield cleaning on a Comanche or complete service for a DC-3, each receives the same prompt attention and meticulous care.

Our large staff of experienced personnel is qualified and equipped to provide specialized service for any light or heavy aircraft requirement. You may be assured that service at SOUTHWEST AIRCRAFT, INC., will result in more efficient performance of your aircraft.

24-Hour Red Carpet Line Service

The extensive service facilities of SOUTHWEST AIRCRAFT, Inc., are nationally known border to border and coast to coast.

★ Overnight Hangar Storage
★ No Tie Down Fee
★ Wash & Polish
★ Maintenance

MOBIL Aviation Gasoline and Oils

★ TV Lounge
★ Coffee Bar
★ Avis Rent-A-Car
★ PBX Service

BOBBIE TAYLOR
Sec. & Treas.

Just land south at Meacham Field, kick left rudder and get ready for a real Texas type welcome.

SOUTHWEST AIRCRAFT, INC.

MEACHAM FIELD, MArket 4-1155,
FORT WORTH, TEXAS

10 Minutes to Downtown Fort Worth
45 Minutes to Downtown Dallas

ROY R. TAYLOR
President

ISLANDS OF 40-FT. TANKS OF COMPRESSED AIR are used on the engine run-up ramp at Chance Vought Aircraft in Dallas, with hoses piping the air to Vought Crusader fighters for starting up their jet engines. The islands of tanks replaced mobile starter carts formerly used.

SHRINKING OF OPERATIONS DICTATES THE SALE OF OUR

1958 Super E-18 Beech

Ram Air Scoops
Propeller Anti-Icers
Windshield Wipers
Super-Soundproofing
Cabin Table
Two Thermos Bottles and Cup Dispenser
Geisse Safety Gear
Two Grimes Rotating Beacons
Extra Batteries
Grimes Instrument Lights
Auxiliary Wing Fuel Tanks
318 Gallons, Total Fuel
Walnut Refreshment Bar
Deluxe Instrument Panel
ARC C-77 Control Console
ARC Type 15E Omni sys. VOR No. 2
ARC Type 15D Omni sys. VOR No. 1
ARC Course Dir. sys.
ARC Type 21A ADF
ARC Type 210 Comm. fr. 118. to 135.95 mc.
ARC T-20 chan. transmitter
R-89 10-chan. glide slope
Flite-Tronics CA3A Audio amp.
Lear 2200 3 light marker

COUCH AND THREE CHAIRS
TAN, BROWN, AND RED INTERIOR
RED, WHITE, AND BLACK EXTERIOR

410 Hours Total Time
Always Hangared and in Absolutely New Condition
$128,000

Will accept equitable trade

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Box 1481
Spokane, Washington

ACTIVE MANAGEMENT OF LEAR, INC., has been turned over by Bill Lear, board chairman, and Richard Mock, executive chairman, to a team headed by James L. Anast, newly elected president, and K. Robert Hahn, executive vice president. Group vice presidents are Andrew F. Haiduck, located in Grand Rapids, and Roy J. Benecchi, also based in Grand Rapids. Lear's new president, Anast, is 40 years old, was formerly technical director of the Airways Modernization Board and principal technical advisor to Edward P. Curtis, special assistant to President Eisenhower for aviation facilities planning. The new vice president, Hahn, is 38 years old and has been with Lear since 1951, serving as director of military products marketing until recently. . . .

OTHER NEW LEAR CHANGES include promotion of Kenneth M. Miller, formerly chief engineer, to be general manager of LearCal Division, the company's civil avionics division, and promotion of Edward F. Conklin, formerly manager, to be assistant to Bill Lear, board chairman.

FAA HAS PROPOSED A NEW RULE CHANGE requiring applicants for student and private pilot licenses to take their physical examination only from FAA-designated medical examiners instead of from any licensed physician as currently permitted. The proposed change has been circulated through the industry and comment from interested persons should be submitted to the Office of the Civil Air Surgeon prior to May 18, 1959.

OFFICERS OF AERONAUTICAL TRAINING SOCIETY were re-elected at the 17th annual ATS meeting last month in Las Vegas. They are: Frank W. Hulse, Southern Airways, Birmingham, president; Clarence E. Page, Page Aircraft, Oklahoma City, vice president, and Harry S. Baer, Jr., Washington, D. C., secretary-treas.

BEECH AIRCRAFT has appointed de Havilland Aircraft of Sydney, Australia, as distributor for Australia, according to Mike Neuberger, Beech vice president in charge of export sales.

BEECH BONANZA No. 10 in the Brazilian air taxi fleet of Reta, Ltd., has been added. The Brazilian firm averages 150 hrs. monthly for each of its 10 Bonanzas. The new K35 Bonanza was purchased through Companhia Carnasciali, Beech distributor at Rio de Janeiro.

ALLISON 501 PROPJET ENGINES OPERATED BY EASTERN AIR LINES have been approved by FAA for 1,000 hours between overhauls following sampling inspection of four engines at 800 hours and two more at 900 hours. Aeroproducts propellers on the engines are approved for 1,250 hrs. before overhaul.

Smallest 3-light marker beacon receiver and indicator, completely self-contained, as displayed above, is the new Narco MBT. It needs no power supply and weighs only 18 ounces.

Midget 3-Light Marker

A major breakthrough in miniaturizing radio-instrumentation equipment is represented by the new Narco MBT 3-light 75-mc. marker beacon receiver and indicator. It is only 1⅛ ins. high, 3⅜ ins. wide and 6 ins. deep. It weighs only 18 ounces and is completely self-contained, requiring no separate power supply and its cabling. Priced at $230, it is completely transistorized, uses printed circuitry and hermetically-sealed units. The MBT draws only five thousandths of an amp. Its lights are press-to-test and it can be tied into the audio system.

SYMBOL FOR SHORT-FIELD JET AIRLINER OPERATIONS is the de Havilland Comet 4, pictured 500 ft. off the ground while passing the terminal building on gross-weight take-off from London Airport. Short take-offs and steep climbs are normal for the Comet.

680E declared the world's fastest MODERN TWIN in its class

At the World Congress of Flight, Las Vegas, Nevada, April 13, 1959, Miss Jerrie Cobb established a NEW WORLD SPEED RECORD in an Aero Commander 680E for aircraft in its weight category over a 2,000 kilometer (1,242.7 miles) course.

Combining comfort with speed, the high-stepping, fast moving 680E is a businessman's dream of luxurious air transportation. With a top speed of 255 mph. and a range of over 1,400 miles, this modern executive twin offers superb performance, carries greater loads and has the range for every operational requirement.

The 680E is truly an all weather airplane providing maximum stability, safety and comfort.

We invite you to visit Brown Aero Corp at Addison Airport in Dallas or Midland Aero Corp at Midland Air Terminal in Midland to inspect the new 680E and find out why Aero Commander is management's business machine of the air.

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The Convair 240 Executive Ayer-Liner originally flown and maintained by American Airlines, with increases in range and weight and deluxe custom tailored interiors by world famous AiResearch . . . $385,000. Standard 40 seat airline configuration . . . $250,000. For a demonstration flight, technical data, trade, lease or lease-purchase information on the most proven and modern executive aircraft in the world, telephone or write:

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WORLD WIDE AIRCRAFT DEALER

Record Participation for Reading Aviation Meet; Planes To Be Judged; New Equipment on Display

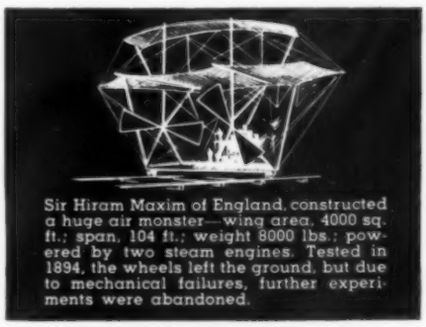
RECORD attendance and participation by corporate and business aircraft owners and pilots are expected for the 10th Annual Maintenance and Operations Meeting in Reading, Pennsylvania, June 5-6, conducted by Reading Aviation Service. Grumman Gulfstream, Lockheed Jetstar, Fair child F-27, Aero Commander Alti-Cruiser and other new aircraft types will be demonstrated by manufacturers and there will be extensive displays of newest products and accessories for business aircraft. Highlight of the two-day event will be judging and presentation of awards for outstanding aircraft in four classifications and four categories, as follows: Best equipped, best of class, best exterior, best interior in single-engine class, twin class under 5,000 lbs., twin class 5,000-12,000 lbs. and twin class over 12,000 lbs. America's top-ranking event conducted exclusively for business flying, the Reading competition is open to aircraft owners and pilots from all sections of the country and draws hundreds of the nation's most outstanding aircraft every year.

New Business In the Hangar

FIVE MORE AIRCRAFT SERVICE COMPANIES have been announced by Charles O. Peacock, president of the Aircraft Electronics Association, as having joined the AEA as authorized members. They are: Walston Aviation, Inc., East Alton, Ill.; Wilson-Wylie Co., Inc., Kansas City, Kas.; Faulkner Air Radio, Inc., Houston; Dallas Aero Service, Dallas, and Aircraft Electronics Specialists, Oshkosh, Wis. The AEA is an organization of leading companies specializing in the installation, repair, maintenance and overhaul of aircraft electronics primarily in business planes.

DALLAS AERO SERVICE, Love Field, Dallas, has Poddy Parrish's Trinity Drilling Lodestar for rewiring. . . . Bob Dodson brought in British American Oil's Lodestar for annual inspection and engine change. . . . Dr. Dimmett's North American B-25 was in for recovering of control surfaces, inspection and cabin window installations. . . . Kermit Wood's Rugene Transport DC-3 was in for annual inspection. . . . Chris Morgan's Mountain States Drilling de Havilland Dove from Denver received engine change and spar modification. . . . Lloyd J. Patton's Dove was in for annual inspection, control brackets and modifications. . . . Ed Wingler's Schlumberger Dove from Houston received annual inspection, landing gear locking lever and other work. . . . Walter Triplett brought in Southland Provisions Dove from Orangeburg, S. C., for double engine change, 1,000-hr. inspection and miscellaneous modifications. . . . Annual inspection and engine overhaul were performed for the Almor Corporation's Aero Commander.

PACAERO ENGINEERING CORP., Santa Monica Municipal Airport, took delivery of Central Soya Company's Lodestar, Ft. Wayne, Indiana, Gabe Ludden, chief pilot, for conversion to a Learstar Mark II. . . . Jim Ketner brought in a Texas Eastern Transmission Lodestar for conversion to a Learstar Mark II, becoming his firm's third Learstar. . . . Doug Garneau's Utah Construction Learstar received double engine change and miscellaneous work. . . . Patrick H. Welder's Learstar was brought in by Paul Crank for double engine change, 100-hr. inspection and interior work. . . . Learstars in for miscellaneous service work included those of Upjohn Co., Joe Betty, chief pilot; U. S. Steel,



Sir Hiram Maxim of England, constructed a huge air monster—wing area, 4000 sq. ft.; span, 104 ft.; weight 8000 lbs.; powered by two steam engines. Tested in 1894, the wheels left the ground, but due to mechanical failures, further experiments were abandoned.

LEADERSHIP

There are those who lead and those who follow.

Organization of the United States Aircraft Insurance Group in 1928 to pioneer "aviation insurance" was leadership that placed and has kept the "U. S. Group" in the forefront of its field.

Now comprised of over 50 companies with multi-billion dollar assets is assurance of sound protection. A thirty year record of prompt and equitable claim and loss adjustments is assurance of prompt service when needed.

Be sure you have "U. S. Group" insurance. Coverage is conveniently arranged through your own agent or broker.

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Al Jones, pilot, and British American Oil, Jack McVicar, chief pilot. . . . Bill Reilly brought in a U. S. Steel DC-3 from Pittsburgh for a paint job.

NORTH AMERICAN AVIATION'S ROLE IN COMMERCIAL AIRCRAFT MARKETING is taking definite shape with appointment last month of R. J. Pfeiffer as manager of commercial aircraft marketing. Pfeiffer until recently was vice president of marketing for Fairchild in handling its F-27 propjet transport and before that had been domestic sales manager for Convair and a sales representative for Douglas Aircraft. North American Aviation has not announced definite commercial plans for its twin-jet Sabreliner UCX utility transport, designed for Air Force production orders.

PACIFIC AIRMOTIVE'S AIRCRAFT DIVISION, Burbank, has delivered Superior Oil's Convair 440 following extensive modifications including outer wing fuel expansion system and related auxiliary oil, and cabin pressurization control unit which eliminates pressure surge when cockpit windows are closed prior to takeoff. Other modifications were made to the oxygen system, floor structure, electrical and fire extinguisher systems, installation of auxiliary ADI tank, auxiliary power unit, Decelostat anti-skid brake units, Sonotone batteries, automatic spark advance, dual cabin window dehydrating system, cabin-size window in cargo door, Safe Flight system, complete interior, radar, and radio modifications. Chief Pilot Dewey Stewart took delivery. . . . Jean Stroh's Max Pray Twin Beech was equipped with the PacAero speed and modernization kit. . . . Arch McGregor took delivery of General Petroleum's Flying Red Horse DC-3 following installation of maximizer kit, double engine change, installation of panorama windows, Janitrol heater system and cabin refurbishing. . . . Complete rewiring, installation of new one-piece instrument panel and other work were performed on Kelly-Springfield Tire's Lodestar, with Aircraft Tank Service performing tank seal and Qualitron installing radar and doing radio modifications. . . . Fairchild Aero Survey's B-17 received 4,000-hr. overhaul, extensive structural and electrical modifications, installation of PB-10 autopilot, photogrammetric equipment, oxygen system, fuel flow meters, electric fuel valves. Tokyo gas tanks and paint job. . . . PacAero Learstar radome and air speed system were installed on Jones & Laughlin Steel's Lodestar along with relicensing, prop overhaul and other work. . . . Al Junker, chief pilot, and Jose Vernali, engineer, brought in Bethlehem Steel's Lodestar 51V for inspection, engine change, wing removal and overhaul, landing

EMERGENCY ENGINE POWER, available from a new PacAero alternate fuel metering system modification he installed recently, saved Malco Refineries' Lodestar last month for John Lyons (above) chief pilot, based at Roswell, N. M. Flying IFR and with Bendix radar at 12,000 ft. in thunderstorms en route to Pueblo, Colo., Lyons was in heavy rain, slush and snow when carburetor heat and alcohol failed to keep his left engine running. After it quit, Lyons restarted it in 4 secs. and maintained normal cruise power with the new alternate fuel source. PacAero's new carburetor modification has been installed on 15 Lodestars and Learstars to date.

Take a heading for READING

Plan Now To Attend

READING AVIATION'S TENTH ANNUAL MAINTENANCE AND OPERATIONS MEETING

It's A Two-Day Spectacular!

Friday, June 5—Saturday, June 6

AT READING MUNICIPAL AIRPORT, READING, PA.

1959 PROGRAM FEATURES

Friday, June 5

- United Air Lines Radar School
- RAS Awards Judging Begins
- Alfred M. Bertolet: Welcome
- Howard R. Hoffman: New Concepts of Weather Forecasting
- Gil Quinby: Manufacturers' Requirements for Radio Maintenance
- A. Bruce Boehm: Air Safety
- Evening Cocktail Party on the Lawn

Saturday, June 6

- United Air Lines Radar School
- William K. Lawton: Welcome
- Art Graham: Terminal ATC
- Max Karant: Air Space Use
- Howard R. Hoffman: Weather
- John Paul Jones: Operating Techniques for Light Twins
- William K. Lawton: Presentation of Reading Aviation Awards

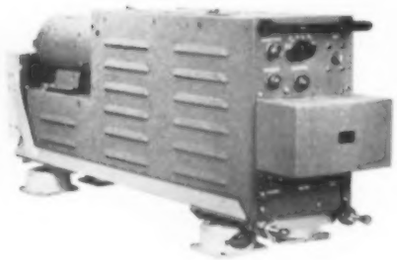
READING AVIATION SERVICE, INC.

Municipal Airport • Reading, Pa. — FRanklin 5-8551

New Dare DTR-360A1 360-Channel Transceiver

15-WATT MINIMUM TRANSMITTER OUTPUT

360-CHANNEL COVERAGE 118.0-135.95 MEGACYCLES WITH 50 KC. SPACING



MEETS FAA TSO C37 AND C38 REQUIREMENTS

The new DTR-360A1 is a quality transceiver throughout, meeting or surpassing every rigid design, manufacturing and inspection specification for FAA TSO approval. That means it's authorized for scheduled airline operation. You are sure of reliable performance in any aircraft.

SCS-DCS, OR CROSS CHANNEL OPERATION

One Dare Control Head provides Single Channel Simplex or Double Channel Simplex operation. Two Dare Control Heads provide cross channel operation or any mode of channel selection you desire.

LIGHT WEIGHT, LOW COST

The transceiver weighs 23.5 pounds. Shockmount and control heads add little more. This lightweight, powerful, high-quality product sells for less than comparable transceivers available today. And, it's available right now from more than 100 leading distributors.

DARE DBA-1 ANTENNA

Ideal with the DTR-360A1 or similar transceiver. Rugged cast-aluminum. 3 pounds. Frequency range 118.0 to 140.0 mc. Better than 1.5 to 1 VSWR over entire band. Also available with long-life protective finish. Standard equipment on many airplanes.

New from Dare!
DADF-1 Transistorized full function ADF
DN-560 Crystal Controlled Omni Nav-Com

DARE INC.
Troy, Ohio

gear AD notes and magnaflux, fuselage Bulletin 112, installation of Sierracin windshields, instrument overhaul, instrument panel modifications and other work. . . . George Fleming's Sears, Roebuck DC-3 was in for engine change, wheel work and installation of Sierracin windshields. . . . Joe Brown's Richfield Oil DC-3 was in for Sierracin windshields, inspection and other work. . . . Double engine change, partial paint job and other work were performed for Kenting Aviation's Canadian PBY.

ANDERSON AIRCRAFT RADIO, Detroit City Airport, has started operations of a new shop at Willow Run Airport, located in the Great Lakes Airmotive hangar. Wendell E. Bell, with Anderson more than 11 years, is in charge of the new Willow Run shop, which is completely equipped to service and install ARC, Bendix, Collins, Dare, Flite-Tronics, Narco and RCA equipment. It is FAA-approved for Radio Class I, II and Limited III. Clare Shuman supervises Anderson's Detroit City shop. Anderson Aircraft radio is a member of the Aircraft Electronics Association.

EXECUTIVE AIRCRAFT SERVICE, Red Bird Airport, Dallas, had one of Ed Armstrong's S. W. Richardson DC-3's in for 100-hr. inspection on engines, 1,000-hr. inspection on wings and exterior paint job. . . . Robert V. Morgan brought in a Mene Grande Oil DC-3 from San Tome, Venezuela, for engine change, 100-hr. inspection, new engine cowling, reupholstering and other work. . . . Russell Purchase's Dow Chemical DC-3 from Midland, Michigan, was in for periodic inspection, landing gear overhaul, Janitrol heater overhaul and new cabin headliner. . . . One of E. P. (Cotton) Jeter's Union Producing DC-3's from Shreveport received engine change and other work. . . . EAS is completing extensive modifications to 6 U. S. Signal Corps R4D's (C-47's) in conjunction with Collins Radio Company, which installed extensive radio and electronic equipment. These airplanes received 8,000-hr. overhaul, engine change to Dash 94 version, installation of complete maximizer kits, interior conversion for electronic laboratory use with special racks, console tables, seating and electrical tun-

SMALL BATTERIES FOR JET AIRLINERS are less than half the size of auto batteries. New Sonotone nickel-cadmimum prime ignition batteries for the Boeing 707 (held in hand) and Douglas DC-8 (on table) are shown. Unit for 707 weighs 10 lbs., measures 2.5 by 4.5 by 14 ins., while that for the DC-8 weighs 12 lbs., measures 4.5 by 4.5 by 10 ins. They operate over 1,000 hrs. without servicing.

Modernize Your Aero Commander

NEW FLUSH ANTENNA SYSTEM

in wingtips and tail cap enclosures

★ **NO DRAG**
★ **BETTER OMNI AND COMMUNICATIONS**
★ **MORE PERFORMANCE**
★ **INEXPENSIVE**

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els for test cabling. Cockpits were modified with large side windows, one-piece bird-proof windshields, lowered hydraulic panels, lowered junction box, complete new electrical systems, long-range cockpit chairs on tracks, 200,000-BTU Janitrol heaters, Walter Kidde Freon engine fire extinguisher systems, radomes for Collins radar, four camera wells in belly, dropable 15-gal. fuel tanks on outer wings, and exterior paint jobs.

L. B. SMITH AIRCRAFT CORP., Miami International Airport, has delivered the second of two 60-passenger Smith Super 46C's in 60 days to Austral Airlines of Argentina. . . . H. Page brought in a U. S. Department of Interior DC-3 for installation of Jato system. . . . A submerged Jato system was installed in W. A. Thompson's Jessop Steel DC-3. . . . H. T. Hartman had H. B. Layne's Super 18 Beech in for inspection and other work.

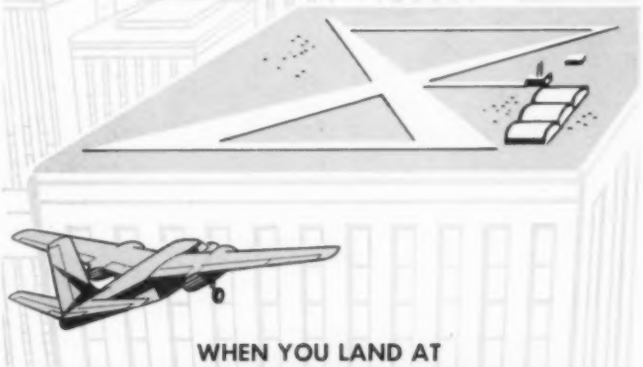
REMMERT-WERNER, Mercer Airport, Trenton, N. J., installed in Ben Wrobel's Columbia Gas Systems' Lodestar a Sperry Zero Reader and integrated instrument system, Sperry engine analyzer, ARC-21A light weight ADF, Collins 17L7-51X-2, 51Z-2 and 51V3, Sapphire 1016, Safe Flight speed control, new radio and instrument panels and fresh de-icer boots. . . . Bill Bennett's Cleveland Brothers

NEW ALTIMETER by Bulova Watch Co., shown with General Omar N. Bradley, Bulova chairman, shows altitude and pressure on tape instead of dial, is being evaluated for easy reading and accuracy by Air Force. Super sensitive, it indicates altitude with an error of less than 10 ft. at sea level and less than 20 ft. at 12,000 ft. Tape is 40 ft. long, registers up to 65,000 ft., is powered by a servo motor and follows true altitude without fluctuation.

E18 Beech was in for double engine change. . . . At Remmert-Werner in St. Louis: Bob Boyanovsky and Bill Frame brought in Peabody Coal's Super 92 DC-3 for a fresh Engine Works engine, polishing and 100-hr. inspection in the Wrap-Around shop. . . . Jack Starkweather got two fresh Engine Work engines for his R. B. Potashnick Construction Lodestar. . . . Erwin Kokes picked up an engine change for Pioneer Tool and Engineering's Twin Bonanza. . . . John Belmeyer's Gardner-Denver Twin Beech received an engine change and 1,000-hr. inspection. . . . Exchange of control surfaces and other work were performed for B. W. Sandberg's Greenlee Brothers DC-3. . . . The Corps of Engineers' DC-3, Jules Austin, pilot, had an inspection and engine change. . . . At Remmert-Werner in Pompano Beach, double engine change was performed for Pete LaFrombois and John Corrier and their Wolfe Industries DC-3.

PIEDMONT AVIATION, Winston-Salem, installed 3-blade Hartzell propellers and carburetor ram air kit on Frank Groat's Hanes Hosier Beech E18. . . . Krispy Kreme Doughnut's Super 18 Beech, Rex Beamer, pilot, was in for Bendix AVQ-50 radar, 3-blade Hartzell, ram air kit and periodic inspection. . . . John W. Frazier, Jr., brought in Material Sales Co.'s Apache for 1,000-hr. check, engine overhaul and piper autocontrol. . . . A Mark V Narco and Piper autocontrol were installed in Henry Gordon's Comanche. . . . High tempera-

It's almost like
LANDING ON YOUR HOTEL



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5 MINUTES FROM DOWNTOWN IN OKLAHOMA CITY

- Big enough for anything (from a "puddle-jumper" to a DC-3)
- Two paved runways (3,400 feet N-S; 2,400 feet NE-SW)
- Night lighting
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FOR CONFIRMED RESERVATIONS CALL YOUR NEAREST CENTRAL AIRLINES TICKET OFFICE OR YOUR TRAVEL AGENT

BIG NEWS

If you or your company have been putting off the purchase and installation of new advanced radio equipment . . . wait no longer! Now, for the first time, and for as little as ⅓ down, DOT Airtronics will expertly install fine new Lear, Collins, or any quality aircraft radio, electronic flight control, communications and navigation equipment . . . and finance the balance over 12 to 24 month period.

COLLINS COMM SYSTEM w/power supply $1395, plus installation

COLLINS BASIC NAV/COMM SYSTEM w/power supply. The 51X-3/17L-8A 344D-1/427B system package provides professional IFR operation. Total weight, only 13.15 pounds. $2370, plus installation.

NEW LEAR ADF-12E—2 SYSTEM Standard system only $1045, plus installation.

NEW LEAR-GONIO FLA-100 ADF ANTENNA SYSTEM. Includes Model ADF-12E-2 Automatic Direction Finder, Amplifier and Lear-Gonio ADF Antenna System. $1225, plus installation.

only 1/3 down...

easy, easy terms . . . up to 24 months to pay the balance. Generous trade-in allowance for your present equipment.

Look to DOT AIRTRONICS — serving all of your needs for aeronautical radio. We specialize in expert installation. Visit us. We'd like to show you around. You'll appreciate our growing facilities and our complete understanding of your problems and needs. There's a reason why, in less than two years, we've become the East Coast's leader in aeronautical radio sales and service.

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ture kit and split cowl kit were installed on Foley, Cox & Judell's Apache from New Orleans.

FIELD AVIATION, Oshawa, Ontario, performed extensive modification and maintenance work on two of Jim Wade's Aerial Photography Company Beech Twins. . . . McNamara Construction's Beech Super 18 is undergoing a 2,000-hr. check. . . . A Miller wing extension kit is being installed and extensive cabin and radio work performed on Lloyd Nourse's Seabee. . . . A new Super 18 Beech was sold to Anthes-Imperial Co., St. Catherine's, Ontario. . . . Field Aviation's new executive hangar at Calgary was opened at the end of April with complete facilities for visiting aircraft.

SOUTHWEST AIRMOTIVE, Love Field, Dallas, reports it has sold three new propjet Grumman Gulfstream corporate transports and has other sales currently in negotiation. Grumman Aircraft has based Carl E. Swanson at Southwest Airmotive as factory liaison and service representative to work with Southwest's distributorship for the Gulfstream. Key members of Southwest's aircraft service staff have been sent through factory training courses for both Grumman aircraft and Rolls-Royce engines. . . . Southwest Airmotive has expanded its Pratt & Whitney distributorship through a 15-state territory extending from Canada to the Gulf of Mexico and including Texas, Oklahoma, Arkansas, Louisiana, Mississippi, Kansas, Missouri, Illinois, Indiana, Nebraska, Iowa, Wisconsin, North Dakota, South Dakota and Minnesota. Warehouses are maintained in Dallas, Houston, St. Louis and Kansas.

DARE, INC., which is Dayton Aviation Radio and Equipment Corp., has completed its new executive offices at its factory in Troy, Ohio, with Louis Pitinsky, president, Elliott Polansky, sales manager, and the sales staff now located there. Bill Burnett, service manager, supervises the Dare service facility at Dayton Municipal Airport, Vandalia.

SPARTAN AIRCRAFT CO., Municipal Airport, Tulsa, installed a Sierracin heated windshield in Dick Smith's Champion Paper PV-1. . . . Phil VanTreuren's Dairypak-Butler Beech 18 was in for installation of extensive radio equipment, 8,000-hr. inspection and overhaul of engines, brakes and landing gear. . . . Ed Thaggard's H. C. Price DC-3 received periodic inspection, engine change, propeller overhaul and Sierracin heated windshield installation. . . . Extensive re-upholstering was per-

DALLAS-GARLAND AIRPORT

JOHN N. HUETT, Manager-Operator

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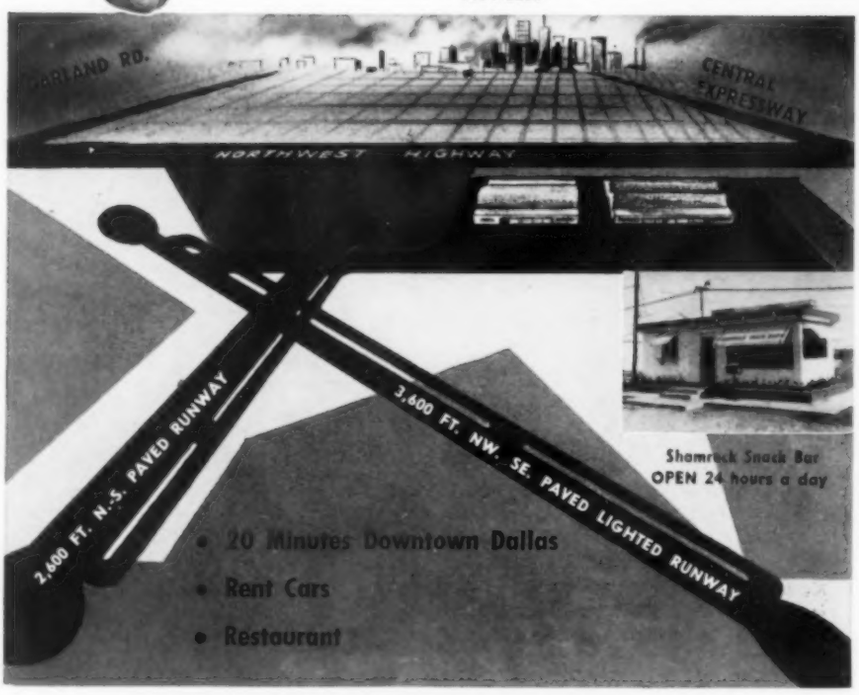

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WE OFFER THE FOLLOWING FACILITIES: ★ Complete Maintenance Facilities ★ Complete Line of Fuel Service ★ Modern Pilot's Lounge ★ Complete CAA and VA Approved Flight Service. ★ HANGAR SPACE NOW AVAILABLE

GRUMMAN GULFSTREAM HAS BEEN PROVISIONALLY CERTIFIED BY FAA, permitting Grumman to conduct pilot training, service-maintenance training and flight operations in environments for which it was designed. The prop-jet is pictured above at Stuart, Florida, where flight testing has been conducted. Meanwhile, Grumman is turning out new planes at a minimum rate of 3 per month, has Airplane No. 19 on the line and expects to have 27 in the air by year's end. The 350-mph. corporate transport has 2,200-mile range, cruises at 25,000 ft. and will operate from runways of less than 4,000 ft.

formed for Penn Wilson's Carter Oil DC-3.

GENERAL AIRCRAFT SUPPLY, well-known Detroit firm, has assumed operation and management of Central Aero Supply, Inc., and the combined operation has merged with Airwork Corp., Millville, N. J., becoming a wholly-owned subsidiary, according to joint announcement by Lawrence F. Zygmunt of General Aircraft Supply and Francis L. Hine of Airwork. General contributes management and additional product lines and Airworks contributes additional capital and a complete line of exchange engines and accessories. Zygmunt continues as GAS president, assisted by Harry L. Mitchell, vice president-treasurer, and John S. Hammond, secretary. Robert Anderson continues as Cleveland branch manager and C. L. (Cy) Montgomery moves from Detroit to be manager at Philadelphia. General Aircraft concentrates on sales and service to fixed-base operators, handling over 100 different product lines and stocking over 15,000 items at each base. It covers an 8-state area including Michigan, Ohio, Indiana, New York, New Jersey, Pennsylvania, Delware and Maryland.

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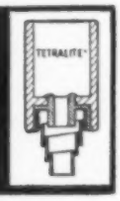

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